DOCUMENT RESUME

ED 303 679 CE 051 981

AUTHOR	Smith, Thomas J.; Trist, Carolyn
TITLE	Training and Educating the Work Force in the Nineties: The Rationale for Public/Private Collaboration. Public/Private Ventures. Information Series No. 331.
INSTITUTION	ERIC Clearinghouse on Adult, Career, and Vocational Education, Columbus, Ohio.
SPONS AGENCY	Office of Educational Research and Improvement (ED), Washington, DC.
PUB DATE	88
CONTRACT	RI88062005
NOTE	65p.
AVAILABLE FROM	Publications Office, Center on Education and Training for Employment, 1900 Kenny Road, Columbus, OH 43210-1090 (Order No. IN331: $6.00).
PUB TYPE	Information Analyses - ERIC Information Analysis Products (071)
EDRS PRICE	MF01/PC03 Plus Postage.
DESCRIPTORS	Adult Education; *Agency Cooperation; Educational Legislation; *Employment Patterns; Employment Qualifications; Federal Legislation; Job Skills; *Job Training; *Labor Force Development; Postsecondary Education; *Private Agencies; *Public Agencies; School Business Relationship; Secondary Education; Vocational Education
IDENTIFIERS	Carl D Perkins Vocational Education Act 1984; Job Training Partnership Act 1982

ABSTRACT

The need for partnerships among deliverers of training in the public and private sectors has reached a critical point if U.S. businesses are to remain competitive. The work force and workplace are being transformed by demographic trends, economic and employment trends, a growing skills mismatch, and concerns over educational effectiveness. Two responses to the changes are de-skilling of jobs and reorganization of work. Responses of the public and private training sectors to these problems and to collaborative efforts for solving them are affected by the history of private sector influence and involvement in job training policy. The failure of the Comprehensive Employment and Training Act led to greater emphasis on joint public-private efforts in the Job Training Partnership Act (JTPA) and Carl D. Perkins Vocational Education Act. The rationale for public-private linkages encompasses the arguments that they can improve national competitiveness and productivity, increase equity in access to employment, and enhance local economic development. Existing forms of collaboration provide guidelines for further attempts to build partnerships. Recommendations call for a greater investment in public education, reorientation of federal vocational education programs, modification of JTPA performance incentives, stronger federal support for public-private training initiatives, and public awareness. (Includes 60 references and a selected bibliography.) (SK)

ED303679

Information Series No. 331

TRAINING AND EDUCATING THE WORK FORCE IN THE NINETIES: THE RATIONALE FOR PUBLIC-PRIVATE COLLABORATION

Thomas J. Smith
Carolyn Trist

Public/Private Ventures

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

- This document has been reproduced as received from the person or organization originating it.
- Minor changes have been made to improve reproduction quality.

- Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

ERIC Clearinghouse on Adult, Career, and Vocational Education
The Center on Education and Training for Employment
The Ohio State University
1900 Kenny Road
Columbus, OH 43210-1090

1988

CE051961

BEST COPY AVAILABLE

FUNDING INFORMATION

Project Title:	ERIC Clearinghouse on Adult, Career, and Vocational Education
Contract Number:	RI88062005
Act under Which Administered:	41 USC 252 (15) and P.L. 92-318
Source of Contract:	Office of Educational Research and Improvement U.S. Department of Education Washington, DC 20208
Contractor:	The Center on Education and Training for Employment The Ohio State University Columbus, Ohio 43210-1090
Executive Director:	Ray D. Ryan
Disclaimer:	This publication was prepared pursuant to a contract with the Office of Educational Research and Improvement, U.S. Department of Education. Contractors undertaking such projects under government sponsorship are encouraged to express freely their judgment in professional and technical matters. Points of view or opinions do not, therefore, necessarily represent official U.S. Department of Education position or policy.
Discrimination Prohibited:	Title VI of the Civil Rights Act of 1964 states: "No person in the United States shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance." Title IX of the Education Amendments of 1971 states: "No person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving federal financial assistance." The ERIC Clearinghouse project, like every program or activity receiving financial assistance from the U.S. Department of Education, must be operated in compliance with these laws.

This publication was prepared with funding from the Office of Educational Research and Improvement, U.S. Department of Education, under Contract No. RI88062005. The opinions expressed in this report do not necessarily reflect the position or policies or OERI or the Department of Education.

TABLE OF CONTENTS

LIST OF TABLES	iv
FOREWORD	v
EXECUTIVE SUMMARY	vii
INTRODUCTION	1
THE CHANGING CONTEXT OF SKILLS TRAINING	3
Demographic Trends	3
Changing Patterns of Employment	4
The Skills Mismatch	8
Educational Quality	12
Workplace Adaptation	13
JOB TRAINING: BACKGROUND AND INSTITUTIONS	19
The 19th Century	19
Vocational Education	19
Federal Job Training Legislation	20
Major Job Training Institutions	21
PUBLIC-PRIVATE COLLABORATION IN TRAINING	25
The Rationale for Collaboration	25
Institutional Cooperation	29
Forms of Collaboration	30
Case Examples	34
CONCLUSIONS AND RECOMMENDATIONS	41
APPENDIX	47
REFERENCES	49
SELECTED BIBLIOGRAPHY	55

LIST OF TABLES

Table

1. CHANGING COMPOSITION OF THE LABOR FORCE 5
2. FASTEST GROWING OCCUPATIONS, 1986-2000 5
3. OCCUPATIONS WITH THE LARGEST JOB GROWTH, 1986-2000 7
4. FASTEST DECLINING OCCUPATIONS, 1986-2000 9

FOREWORD

The Educational Resources Information Center Clearinghouse on Adult, Career, and Vocational Education (ERIC/ACVE) is 1 of 16 clearinghouses in a national information system that is funded by the Office of Educational Research and Improvement (OERI), U.S. Department of Education. This paper was developed to fulfill one of the functions of the clearinghouse--interpreting the literature in the ERIC database. This paper should be of interest to employment and training personnel in private industry, vocational and adult education policymakers and practitioners involved in developing training programs, and others interested in effective partnerships between the public and private sectors.

ERIC/ACVE would like to thank Thomas J. Smith and Carolyn Trist for their work in the preparation of this paper. Currently Vice President, Director of External Affairs and Director of Special Projects at Public/Private Ventures (P/PV), Mr. Smith directed the Summer Training and Education Project, the State Employment Initiatives for Youth Demonstration, and the Private Industry Council Study. His 17 years of experience in demonstration management, planning, and research include service as an economic development analyst for the City of Philadelphia and as an income maintenance worker, social worker, and human service planner for the Pennsylvania Department of Public Welfare.

Ms. Trist is an assistant program officer at P/PV, where her work has included co-authorship of *A Practitioner's Guide: Strategies, Programs and Resources for Youth Employability Development* and preparation of a videotape companion to the guide. Her academic background includes a master's thesis on collaborative development strategies for linking government and community organizations and field study of the environmental impacts of development programs in Jamaica. As an intern in the United Nations Division for Nongovernmental Organizations, she prepared case studies on UN collaboration with community organizations in Africa.

The following people are also acknowledged for their critical review of the manuscript prior to publication: Gerard G. Gold, National Institute for Work and Learning; Paul E. Barton, National Assessment of Educational Progress-Educational Testing Service; Donald M. Clark, National Association for Industry-Education Cooperation; Santee C. Ruffin, National Association of Secondary School Principals; Susan Klein, Clearinghouse Monitor, and Nevzer Stacey, Higher Education and Adult Learning Division, OERI; and Morgan Lewis, Research Scientist; William Hull, Senior Research Specialist; Roy Butler, Senior Research Specialist; and Valija Axelrod, Research Specialist 2, the Center on Education and Training for Employment.

Wesley Budke coordinated publication development with editorial assistance from Sandra Kerka. Janet Ray served as word processor operator, and editorial review was provided by Judy Balogh.

Ray D. Ryan
Executive Director
The Center on Education
and Training for Employment

EXECUTIVE SUMMARY

The need for partnerships among deliverers of training in the public and private sectors has reached a critical point. If U.S. businesses are to remain competitive in the world marketplace, public providers of training--including vocational and adult educators--and employer-based providers of training must find ways to pool their knowledge. Dwindling resources with ineffective or duplicative delivery systems for education, training, and support services make the development of better linkages a necessity.

Addressing this need requires understanding of the following factors:

- Changes in the work force and workplace and resulting changes in skill needs
- Implications of these changes for education and training
- Characteristics of effective public-private partnerships

The work force and workplace are being transformed by the following factors:

- Demographic trends that are changing the composition of the labor force--more women, minorities, and immigrants and a smaller youth cohort
- Economic and employment trends such as the change to a service-producing economy and the impact of technology
- A growing mismatch between the skills workers have and those that employers require, necessitating remedial workplace training in such areas as literacy skills
- Concern over the effectiveness of existing educational systems to prepare students for work or further education

Two possible responses to the skill shortage are de-skilling of jobs and reorganization of work. De-skilling means reducing the skill level of jobs through automation or fragmentation of tasks, resulting in work that is more routine, monotonous, and demoralizing. The controversy surrounding this issue suggests that significant rises in skill levels may be occurring in some occupations while others are experiencing the de-skilling effect.

Another response to skill shortages is to reorganize the workplace in such a way that enables workers to learn more on the job, understand the system in which they are working, and take greater responsibility for their work. This solution demands a work force possessing higher-order thinking skills and adaptive abilities.

The responses of the public and private training sectors to these problems and to collaborative efforts for solving them are affected by the history of private sector influence and involvement in job training policy. The failures of such federal programs as the Comprehensive Employment and Training Act led to greater emphasis on joint public-private efforts in the Job Training Partnership Act (JTPA) and the Carl D. Perkins Vocational Education Act. At the same time, employers are making huge investments in training, ranging from remedial education to retraining to human resource development.

The rationale for public-private linkages to improve the quality and relevance of job training encompasses the arguments that they can (1) improve national competitiveness and productivity, (2) increase equity in access to employment for the disadvantaged, and (3) enhance local economic development.

Existing forms of collaboration provide guidelines for further attempts to build partnerships. Two basic forms include--

- o open-ended collaborations--cooperative efforts among two or more institutions that set broad, long-term goals. Examples are industry-education councils, local education funds, school-business partnerships, and quasi-public skills brokering corporations.

- o project-specific collaborations--efforts intended to meet more narrowly defined, short-term goals. Examples are state-funded employer-based training, contract training, and union training programs.

A review of the workplace context and the public-private linkages in it leads to several conclusions:

- o The mismatch between projected labor supply and demand will have substantial effects on the economy in the future.

- o The definitions of basic skills and job training are likely to change.

- o Increased collaborations will be complicated by such factors as demographic change, rising skill requirements, and changes in the workplace.

The following recommendations are for broad policy initiatives that will serve the education and training needs of the work force and prompt greater collaborative interaction:

1. Strengthen and enlarge the nation's investment in public education.

2. Reorient federal vocational education programs to permit greater flexibility, more service to disadvantaged persons, and more private sector participation.

3. Modify JTPA performance incentives to encourage longer-term investments for innovative education and training programs.

4. Provide stronger federal support for public-private training initiatives.

5. Support development and use of techniques that teach higher-order and cognitive skills.

6. Build public awareness of the nature of economic and workplace changes and promising cooperative solutions.

Information on work force training and public-private sector collaboration may be found in the ERIC system using the following descriptors: Adult Education, *Cooperation, *Employment Patterns, Employment Qualifications, Job Skills, *Job Training, *Labor Force Development, Postsecondary Education, *Private Agencies, *Public Agencies, School Business Relationship, Secondary Education, Vocational Education. Asterisks indicate descriptors having particular relevance.

INTRODUCTION

The U.S. economy is entering a decade when, for the first time in many years, demand for labor--particularly entry-level workers--is likely to outstrip the available supply; when training and retraining are assuming greater importance in responding to rapid changes in technology; and, consequently, when the basic capacities and preparedness of American workers are pivotal factors in economic growth. Collaborative alliances between the public and private sectors are necessary to address the growing--and increasingly complex--need for training and education of the U.S. work force.

Review of the research literature, especially recent writing and thinking, suggests more than anything else that the United States is at a critical juncture with regard to work force preparation and that more widespread development of collaborative alliances must occur.

This paper reviews that current writing and thinking. The review is organized around three broad questions:

1. What forces are shaping the work force and the need for skills in that work force?

2. What are the implications of the resulting changes both in the work force and workplace for training and education activities and for collaboration between the public and private sectors?

3. What current partnerships seem to offer the most promise in addressing education and training needs in the decade to come?

No attempt is made here to provide definitive answers to the three broad questions. The paper first explores the unusual coincidence of forces that have generated basic changes affecting the work force. Demographic changes, the rapidly shifting nature of work and the heightened need for more and different skills are combining to create a situation in which, during the next decade, skills shortages will become a certainty, labor demand will extend to every level of available workers, and "training" and "education" will therefore assume new shapes and meaning.

Such changes point to both uncertainty and volatility in the decade to come. Twenty years ago, it was possible to argue that workers needed "basic skills," which they acquired in school, and occupational/skills training, which they acquired in the workplace, specialized institutes, or programs. Now the distinction between the two is blurred. The workplace demands not just an identifiable set of skills, but adaptiveness and flexibility, cognitive and "processing" skills--in short, the capacity to learn and change as the workplace changes.

Moreover, skills are now acquired in a variety of places. The private sector performs an increasingly broad array of educational functions. In part, this

is in response to shortcomings in the performance of schools. It may also be a response to rapid changes in what needs to be learned and taught--changes to which the private sector can, for the present, respond more efficiently and quickly than can public institutions. The end result, in any case, is that it is difficult to find the line of demarcation between public and private training activity and also difficult to say where that line should be.

Collaborative ventures hold increasing promise as a way to strengthen training efforts in an efficient way. Though the paper discusses the major types of partnerships in existence and provides examples of some of the very best now operating, it is crucial to recognize that such initiatives, however promising or effective, are still only a small part of the field.

Nonetheless, the growing labor shortage; the shifting character of skill needs, training, and education; and the changing roles of private and public sectors all suggest that collaborative projects will be important in the decade ahead. The fluid character of the field makes it difficult to prescribe forms or types of interventions.

A common thread in the discussion that follows is this: how can training and education be strengthened in order to provide better service for the educationally and economically disadvantaged segments of the working population? In the decade ahead, new entrants to the work force will dwindle even as skill requirements increase. Poorly educated and marginally skilled workers will be displaced even as the demand for better trained labor rises. Thus, better preparation and retraining for these "marginal" segments of the work force is an issue that will assume increasing importance.

In listing recommendations, the paper focuses on broad policy directions--those likely to strengthen educational and training efforts, make them more responsive to workplace needs, and serve disadvantaged youth and adults. For these groups in particular the changing workplace in the decade ahead holds great promise and opportunities. Better training and skills will equip them to exploit those opportunities to the fullest.

THE CHANGING CONTEXT OF SKILLS TRAINING

The combined forces of demographic change, technological advancement, and increasing international competition are significantly changing training requirements in and for the workplace. This, in turn, is changing the relationship between education and work.

This section summarizes the forces that are currently changing the workplace and, concomitantly, education and training requirements for work. It then discusses two possible large-scale responses to these changes in the workplace--de-skilling and new forms of work organization--and their implications for the education and training system.

Four distinct trends are giving rise to new demands on education and training institutions that are immediate and critical:

1. The demographic situation in the United States is changing dramatically, resulting in a shortage of young entry-level workers and qualified skilled workers in many growing industries.

2. The expansion of service sector employment and the impact of new information technology and microelectronics are altering patterns of employment, displacing workers and restricting jobs in some areas while creating new opportunities in others.

3. The nature and level of skills required for adequate work preparation are changing. This is resulting in a mismatch between the skills workers have and those that many businesses and industries need.

4. The capacity of the current education system to meet these new demands is coming under question.

Without adequate educational preparation and training for the full range of current and potential participants in the labor force, the ability of the U.S. economy to adapt, remain internationally competitive, and provide a high standard of living comes into serious question. This is especially true for displaced workers, educationally disadvantaged youth, minorities, immigrants and the handicapped.

Demographic Trends

As the entrance of the "baby-boom" generation into the labor force comes to an end, the economy is faced with a labor shortage replacing the labor surplus that characterized the 1950s, 1960s, and especially the 1970s. The composition of the labor force is shifting to comprise a larger proportion of women, older workers, minorities, and immigrants. The proportion of youth aged 16-24 in the labor force dropped from 23 percent to 20 percent between 1972 and 1986 and will drop further, to only 16 percent, by 2000 (U.S. Bureau of Labor Statistics 1988). The shrinking youth cohort is a major cause of the labor shortage.

However, although a slowdown in the

growth rate of the labor force as a whole is projected for 1988-2000, the annual growth rates of black, Hispanic, Asian, and other subgroups of the labor force remain significantly higher than for whites. The growth rates projected for 1986-2000 (see table 1) are 1.0 percent for whites, 1.8 percent for blacks, 4.1 percent for Hispanics, and 3.9 percent for Asians and others (ibid.). These projections indicate that nonwhites will make up nearly one third of the new entrants into the labor force from 1988 to 2000 and that nonwhites, women, and immigrants together will make up more than five-sixths of the net additions to the work force (Johnston and Packer 1987). Hodgkinson (1986) describes the growing "minority majority":

> We find in Texas, for example, that 46 percent of the public school students are minority and in Arizona, 33 percent. In New York it's 32 percent, in Maryland, 33 percent. . . . Nonwhite young people form such a large percentage of the cohort that . . . the fate of whites . . . is inextricably locked into the fate of minorities. (p. 9)

The changing composition of the labor force, combined with the shrinking of the youth cohort, is forcing employers to recruit young entry-level workers from groups conventionally viewed as marginal or disadvantaged. In other words, new workers in the near future will come in large part from groups that the education and training system in the United States traditionally has not served well. A greater number of needed workers may be educationally disadvantaged, requiring remedial or English as a second language instruction. This is already creating pressure for improvements in educating a broader range of students with different abilities and backgrounds; private companies are impelled to implement their own remedial education programs.

Changing Patterns of Employment

Structural shifts in the economy, primarily through the contraction of U.S. manufacturing and expansion in the service sector and high-tech industries, are changing the patterns of employment in a number of ways. Interpretations of these patterns are often contradictory. The key trends can be broken down as follows:

- **The fastest growing industries, by rate, will continue to be in high technology, but the net additions of jobs in these industries will not be substantial. Furthermore, jobs created in high-tech fields will be open mostly to skilled workers. Thus growth in this area will not absorb much of the work force. (See table 2.)**

Although the rates of growth are striking in the high-tech fields, the total number of high-tech jobs the economy is going to generate by 1990 is less than 1 million, compared to the 21 million total new jobs (Hodgkinson 1986). For example, the rise of the microelectronics industry has created primarily skilled and professional positions. Yet, semiskilled and "unskilled" workers in related areas such as semiconductor and computer manufacturing are more likely than other workers to lose jobs because of automation and offshore production (Alic and Harris 1986). Advances in technology, Alic and Harris conclude, create jobs primarily for skilled workers.

- **The structural context of work in this country has been undergoing a fundamental transformation from a primarily goods-producing economy to a primarily service-producing one. The last two decades have witnessed**

TABLE 1

CHANGING COMPOSITION OF THE LABOR FORCE

	Labor Force (in millions)			Growth Rate	
Group	1972	1986	2000	1972-1986	1986-2000
Total	87.0	117.8	138.8	2.2	1.2
White	77.3	101.8	116.7	2.0	1.0
Black	8.7	12.7	16.3	2.7	1.8
Asian and other	N/A	3.4	5.7	N/A	3.9
Hispanic	N/A	8.1	14.1	N/A	4.1

SOURCE: U.S. Bureau of Labor Statistics (1988)

TABLE 2

FASTEST GROWING OCCUPATIONS, 1986-2000

Occupation	Change in employment, 1986-2000		Percent of total job growth, 1986-2000
	Number (in thousands)	Percent	
Paralegal personnel	64	103.7	.3
Medical assistants	119	90.4	.6
Physical therapists	53	87.5	.2
Physical and corrective therapy assistants and aides	29	81.6	.1
Data processing equipment repairers	56	80.4	.3
Home health aides	111	80.1	.5
Podiatrists	10	77.2	.0
Computer systems analysts, electronic processing	251	75.6	1.2
Medical records technicians	30	75.0	.1
Computer programmers	335	69.9	1.6
Radiologic technologists and technicians	75	64.7	.3

SOURCE: U.S. Bureau of Labor Statistics 1988

> a substantial growth in employment in the service sector and a relative decline in manufacturing industries.

What this pattern means for workers and the economy is the subject of some controversy. Bluestone and Harrison (1982) argue that the shift away from manufacturing is not a healthy, inevitable economic evolution, but rather is symptomatic of "widespread, systematic disinvestment in the nation's basic productive capacity" (p. 6). Bluestone and Harrison conclude that the human and social costs of mass job losses from plant closings and contractions are much too high to justify profit-margin motivated company policies and "laissez faire" government policies that are perpetuating deindustrialization.

Although Kutscher and Personick (1986) concede that declines in production and output have hit certain industries particularly hard, they hold the alternative view that "the shift to a service economy is not really evidence of a declining industrial base. . . . The shift has largely been a relative one. Employment in the manufacturing sector in absolute terms has not declined appreciably over the last two decades" (p. 3). Although goods-producing industries, in aggregate, may not have appreciably declined, serious job losses have occurred on a local basis in manufacturing. The growth industries are primarily in the service sector, giving services a dominant share of the economy and contributing new jobs that will absorb new entrants to the labor force and many displaced workers as well. According to the *Workforce 2000* report, improving U.S. economic prospects lies in enhancing productivity in the service industries that now have the greater share of the economy (Johnston and Packer 1987).

- **Occupations that will provide the largest net addition of jobs will be primarily in the service sector. But these jobs are predominantly low-skill, low-wage positions such as retail salespeople, waiters and waitresses, janitors, orderlies, cashiers, clerical workers, secretaries, and guards. (See table 3.)**

Exceptions are the few high-skill, high-paying occupations that are contributing a significant number of new jobs. These are for registered nurses, managers, engineers, and lawyers--professionals who require large investments in education. There are very few jobs to which semiskilled workers can easily transfer without considerable investment in retraining or a significant drop in income.

Though it holds the potential to raise work force productivity, the shift to a service-dominant economy may be negatively affecting a large portion of the work force. There is evidence that the distribution of opportunity is radically different in the service sector than in a manufacturing-based economy. Kuttner (1983) argues that job opportunities are polarizing:

> As the economy shifts away from its traditional manufacturing base to high-technology and service industries, the share of jobs providing a middle class standard of living is shrinking. An industrial economy employs large numbers of relatively well-paid production workers. A service economy, however, employs legions of key punchers, sales clerks, waiters, secretaries and cashiers, and the wages for these jobs tend to be comparatively low. (p. 60)

These low-level service jobs also tend to be nonunion. Although there continues to be disagreement on this subject, Kuttner believes that the major threat to the work force is not unem-

TABLE 3

OCCUPATIONS WITH THE LARGEST JOB GROWTH, 1986-2000
(Numbers in thousands)

Occupation	Change in employment, 1986-2000		Percent of total job growth, 1986-2000
	Number	Percent	
Salespersons, retail	1,201	33.5	5.6
Waiters and waitresses	752	44.2	3.5
Registered nurses	612	43.6	2.9
Janitors and cleaners, including maids and housekeeping cleaners	604	22.6	2.8
General managers and top executives	582	24.4	2.7
Cashiers	575	26.5	2.7
Truck drivers, light and heavy	525	23.8	2.5
General office clerks	462	19.6	2.2
Food counter, fountain, and related workers	449	29.9	2.1
Nursing aides, orderlies, and attendants	433	35.4	2.0
Secretaries	424	13.1	2.0
Guards	383	48.3	1.8
Accountants and auditors	376	39.8	1.8
Computer programmers	335	69.9	1.6
Food preparation workers	324	34.2	1.5
Teachers, kindergarten and elementary	299	19.6	1.4
Receptionists and information clerks	282	41.4	1.3

SOURCE: U.S. Bureau of Labor Statistics 1988

ployment, but rather the increasing concentration of jobs in a few very high-paying fields and in numerous low-paying positions, with fewer and fewer jobs in the middle.

- **At the same time, the fastest declining occupations, in terms of total number of jobs, will also be low-skilled and semiskilled. This decline will particularly hurt the large numbers of minority, lower-income, and educationally disadvantaged people currently employed in these occupations. (See table 4.)**

The loss of these jobs reduces reasonably well-paying opportunities for workers with relatively low skills. Declining occupations include many clerical positions, typists and word processor operators, data entry operators, private household workers, machine operators, textile workers, assemblers and other handwork occupations, and several categories under helpers, laborers, and material movers (U.S. Bureau of Labor Statistics 1988). Many of the declining occupations provided reasonably good blue-collar wages. As employment shifts away from these occupations, whether toward service jobs that are higher- or lower-skill, skill needs will certainly change and thus require some adaptation in the educational preparation of workers.

In summary, changing employment patterns are bringing about large losses in semiskilled and low-skill jobs, mostly in manufacturing industries, and large additions in low-skill, low-quality service jobs. Though well-paying occupations in the service and high technology fields are also growing, mobility across and within occupations with differential skill levels is becoming increasingly restricted. Natural ladders for on-the-job learning and promotion are being eliminated, and the ability to advance or transfer to better jobs increasingly requires additional formal education and training. The ability of the work force to adapt, increasing economic productivity and avoiding dead-end jobs, will thus depend greatly on improvements in education and training.

The Skills Mismatch

As demographic trends are changing the composition of the work force, a simultaneous change is occurring in the technology the new and current work force will be required to use. There is evidence that the basic skill requirements for work are rising and that skill deficiencies are common in the workplace. The impact of technology on job-specific skills is not so clear. As Cyert and Mowery (1987) note, "a substantial body of literature on the skill impacts of technological change has reached few consistent conclusions" (p. 99). At the least, it appears that the level of basic skills required prior to employment is increasing and expanding to include more abstract abilities. Those job-specific skills learned and applied in the workplace that are increasing in high-tech fields may actually be decreasing in service and many manufacturing jobs. The latter situation, in which de-skilling is a response to the changing context of work, is discussed in the section on Workplace Adaptation.

Evidence for Rising Skill Requirements

Rapid technological change, primarily as a result of the microelectronics revolution, is generating demands that much of conventional education and training is failing to meet. According to *Building a Quality Workforce* (1988), "technological innovation has changed and will continue to change the employment environment. Entry-level

TABLE 4

FASTEST DECLINING OCCUPATIONS, 1986-2000

Occupation	Employment Numbers (in thousands)		Percent decline in employment
	1986	Projected 2000	
Electrical and electronic assemblers	249	116	-53.7
Electronic semiconductor processors	29	14	-51.1
Railroad conductors and yardmasters	29	17	-40.9
Railroad brake, signal, and switch operators	42	25	-39.9
Gas and petroleum plant and system occupations	31	20	-34.3
Industrial truck and tractor operators	426	283	-33.6
Shoe sewing machine operators and tenders	27	18	-32.1
Station installers and repairers, telephone	58	40	-31.8
Chemical equipment controllers, operators, and tenders	73	52	-29.7
Chemical plant and system operators	33	23	-29.6
Stenographers	178	128	-28.2
Farmers	1,182	850	-28.1
Statistical clerks	71	52	-26.4
Textile draw-out and winding machine operators and tenders	219	164	-25.2

SOURCE: U.S. Bureau of Labor Statistics 1988

employees will work with more sophisticated tools, perform multiple tasks and will have to respond to ongoing technological change within their trades" (p. 27). This is true even for many low-skill, low-wage jobs. Coupled with demographic changes, technological advancement has caused skill shortages in many businesses and industries.

In their analysis of changing educational and skill levels, Johnston and Packer (1987) indicate that the fastest growing jobs depend on significantly higher math, language, and reasoning capabilities than does the current occupational mix. According to the Department of Labor scale of lowest skill (1) to highest skill (6) jobs, the reading ratings for current jobs are 3.5 and 4.2 for fast-growing jobs; the math ratings are 2.6 for current jobs and 3.1 for fast-growing; and the language ratings are 3.1 and 3.8, respectively. They report further that "only 4 percent of the new jobs can be filled by individuals with the lowest levels of skill, compared to 9 percent of jobs . . . today. At the other end of the scale, 41 percent of the new jobs will require skills ranked in one of the top three categories compared to only 24 percent . . . at present" (p. 99).

However, it may be misleading to take these numbers at face value, since they compare the total mix of jobs existing now with only the new jobs that will be added by the year 2000. This comparison may overstate the difference in skill levels. The Johnston and Packer point is most relevant, though, in light of the fact that those new jobs will absorb many new entrants to the labor force if they have the requisite skills.

Changing skill requirements are not only affecting new entrants to the labor force but the existing work force as well. Consequently, many companies are themselves being forced to provide remedial education to both groups. Retraining, which is becoming central to employers' competitive strategies, raises additional needs for basic skills enhancement. Since workers must have a minimum level of literacy and computational ability to take advantage of retraining opportunities, much of what they need to learn goes beyond what was traditionally considered basic skills. Retraining programs, accordingly, have had to adapt.

For example, the United Auto Workers-Ford National Education, Development and Training Center renamed its Basic Skills Enhancement Program simply the Skills Enhancement Program (SEP). Because statistical process control, computerized materials handling, and increasing use of robotics have changed life on the production line permanently (Lee 1988), SEP now provides workers with necessary knowledge not just in basic reading and math, but also in algebra, trigonometry, and statistics.

Johnston and Packer as well as many of the witnesses during the 1987 Congressional hearings on Competitiveness and the Quality of the American Workforce believe that overall skill requirements are rising and that there is a critical mismatch between new demands and the present and future work force's skills.

Diehl and Mikulecky (1980) find that, even for current jobs, there is a mismatch of skills and a need for better worker literacy. Seventy percent of the written material in the workplace is between the 9th- and 12th-grade levels and 15 percent is even higher. Rising educational requirements for work are also documented by Johnston and Packer (1987):

> Of all the new jobs that will be created over the 1984-2000 period, more than half will require

> some education beyond high school and almost one-third will be filled by college graduates. . . . The median years of education required by the new jobs . . . will be 13.5, compared to 12.8 for the current work force. (pp. 98-99)

The Literacy Problem

The inability of a large proportion of Americans to meet the new literacy requirements is clear in a Congressional Research Service review of illiteracy estimates from 1975, 1980, 1982, and 1985 (Irwin 1988). A 1975 Adult Performance Level study concluded that 20 percent of adults were functionally incompetent, and 34 percent were marginally competent or "just getting by." The 1980 Census indicated that nearly 1 million people in the United States were illiterate in the conventional sense of not being able to read or write at all.

More recent estimates include a 1982 Department of Education survey that determined an illiteracy rate of 13 percent of Americans over 20 years old--17-21 million people. In 1985, the Census Bureau estimated that 11 million people over the age of 25 had completed 8 years of school or less and 38 million had completed less than 12 years. However, years of school completed is not a reliable indicator of functional literacy levels, as many students complete school without acquiring the corresponding level of skills.

The recent National Assessment of Educational Progress study (Kirsch and Jungeblut 1986) found troubling signs in its assessment of literacy skills among 21- to 25-year-olds. The study concluded that "while the overwhelming majority of young adults adequately perform tasks at the lower levels on each of . . . three scales, sizable numbers appear unable to do well on tasks of moderate complexity. Only a relatively small percentage of this group is estimated to perform at levels typified by the more complex and challenging tasks" (p. 4). Similar deficiencies exist in computational skills. The study found that two-thirds of those sampled were unable to read a menu and compute the amount of change they would receive if they bought two items and left a 10 percent tip.

There is also a consistent strain of anecdotal evidence from individual firms that are experiencing increasing skill requirements and, as a consequence, are finding it difficult to fill positions. Several examples are reported in *Building a Quality Workforce* (1988):

> More and more businesses are citing difficulties in finding qualified applicants. At New York Telephone Company, only 20 percent of those taking an operator's test pass. At Campbell-Mithun Advertising in Minneapolis . . . the ratio of applicants to those qualifying is 20:1 for secretaries and 10:1 for supply and mail clerks. Motorola finds that only 20 percent of its applicants can pass a simple seventh grade English comprehension or fifth grade math test. (pp. 13-14)

The continuation or growth of such a skills mismatch may have serious consequences for workers and for the economy as a whole. Jobs that hold the greatest promise both for economic productivity and career advancement are most often those with higher skill requirements. Furthermore, the range of necessary skills is broadening. Narrow or fixed occupational skills will be increasingly insufficient in a workplace that values adaptability and creativity

in face of rapid change.

Educational Quality

Even as the need for new and better kinds of skill accelerates and functional illiteracy rates remain high, the response in education lags behind. Levin (1985) states that at least 30 percent of elementary and secondary students are educationally disadvantaged due to poverty, cultural obstacles, and linguistic barriers, and are therefore in danger of emerging from school unprepared for work or further education.

Education's Shortcomings

The educationally at risk are disproportionately children of poverty. Although the gap between white and minority educational performance is narrowing, the disparity remains alarming (Barton 1988). Further, most of these students lack the home and community resources to benefit from conventional schooling. Levin (1985) asserts that many proposed school reform measures have little to offer disadvantaged youth. These findings are reaffirmed in a recent report issued by MDC, Inc. (1988), a research and program development organization in North Carolina, entitled *America's Shame, America's Hope: Twelve Million Youth at Risk.*

The publication of *A Nation at Risk* (National Commission on Excellence in Education 1983), which highlighted the failure of the schools to prepare youth adequately for a productive life, stimulated public demands for educational reform. Yet, those benefitting from the reform movement are not often enough those most in need. MDC finds that the federal financial commitment to education has declined during the 1980s and that only 5 percent of state education funds are directed specifically to helping at-risk youth. Furthermore, the report claims, there is evidence that some reform efforts, such as raising graduation standards, are actually harming at-risk youth. MDC concludes that--

> the most formidable barriers to assisting at-risk youth do not concern lack of money but failure to perceive them as in need of specific long-term attention, resistance to institutional change at the state and local level, and an absence of genuine leadership at the federal level. (p. 5)

The New Basics

The fact that the schools are lagging behind in preparing youth for the world of work is exacerbated by rising expectations as to what the schools should deliver. Yet, meeting the basic educational needs of at-risk youth and bringing vocational education up to par are only part of the task of educational reform. In addition, basic educational preparation for work is being redefined to include much broader skills than previously necessary.

Resnick (1987) proposes the adoption of "new basics" in education and training--that is, higher-order thinking, including reasoning, learning, and problem-solving abilities. She defines higher-order thinking as involving "a cluster of elaborative mental activities requiring nuanced judgment and analysis of complex situations according to multiple criteria. . . . The thinker's task is to construct meaning and impose structure on situations, rather than to expect to find them already apparent" (p. 339). Resnick maintains that training in specific, limited skills is becoming obsolete due to the rate at which the technological

and social structure of work is changing. Workers need more and more to interact with "smart" tools and to respond to breakdowns in complex systems. Therefore, ability to adapt and learn continuously on the job is a more important goal for education.

The implications of these new demands on the educational system are summed up by Curtis Plott of the American Society for Training and Development (Melloan 1988): "It's not higher levels of the old-time religion that are required (reading, writing and arithmetic); it's new interpersonal skills, teamwork skills, logic skills, the ability to learn, problem-solving skills, [and] critical thinking skills" (p. 39).

The combination of increasing expectations, a growing population of disadvantaged youth, and the inflexibility of the conventional school system in responding to change has created a serious shortfall in the delivery of high quality education. The implications that this shortfall has for the future have focused considerable attention on ways to improve the educational system.

Workplace Adaptation

Two potential large-scale responses appear capable of coping with the changes in the workplace and labor supply. The workplace is adapting to both the limitations of the labor supply in quantity and quality and the innovative possibilities permitted by new technologies and forms of work organization. Two major trends will determine how the quality of work is affected: first, reducing the skill level of jobs through automation or fragmentation of tasks and second, reorganizing workplace relations to foster greater individual responsibility, learning, and cooperation. A critical determinant of which response will dominate in the future will be the quality and extent of education and training for the work force.

The De-Skilling Controversy

One response to skill shortages in the workplace is to apply technology in a way that reduces the need for skilled labor, or "de-skills" work. There has been considerable debate over the degree to which this is really occurring in the new information technology and service industries (e.g., Adler 1986; Attewell 1987; Braverman 1974; Levin and Rumberger 1983).

Levin and Rumberger (1983) maintain that "in spite of continuing advances in technology and the widespread shift toward automation, job-skill requirements have changed very little over the last two decades" (p. 20) and that many advances have sharply reduced the job-specific skill levels required. (See also Levin and Rumberger 1987.) Although aggregate analyses are inconclusive, case study evidence points more toward the de-skilling effect. Examples of this are found in situations where multiple-task jobs are broken up; information processing, computation, and analysis are taken over by computers and the worker is left with the most routine tasks. Common instances are fast food chain cash registers with pictures replacing numbers, electronic scanners that enter prices and calculate change in supermarkets, and the proliferation of data entry operators.

The Communications Workers of America union reports that, in its experience with the Bell System, "while in some cases technology requires new skills, all too often it leads to de-skilling and fragmentation of work. Jobs become monotonous, stressful and boring" (Work America Institute 1985, p. 7).

Kuttner (1983) cites the case of computerization in Blue Cross/Blue Shield of Massachusetts. Computers have upgraded the quality of work for managers and accountants while eliminating the ladder of opportunity for the clerical pool. Computerization has enabled decentralization of the claims department, which now locates branches in areas where there is high labor supply and little wage competition. Claims clerks sit at computer terminals and process piles of forms simply by typing in code numbers and fees. The computer verifies the claims, and a separate department handles more complex cases. Each clerk can be trained in only 4 weeks. Kuttner concludes that, though productivity has increased and labor costs have been reduced, the new system has not translated into better jobs. The work is more routine and morale is low.

In the case Kuttner describes, the new jobs created do require new skills--computer operation--in addition to basic literacy. However, the work is simplified, routinized, and of low quality in terms of worker satisfaction, pay, and the potential for advancement. In this sense, the de-skilling that has occurred is closely related to the quality of work.

The de-skilling argument has been countered by Attewell (1987) and Adler (1986). Though Adler allows that there are cases in which automation has led to a reduction in skill requirements, he claims that this is neither necessarily nor usually so. The transfer of tasks from worker to machine, he argues, creates the new task of deploying the machines' capabilities. "While the net effect of subtractions from, additions to, and qualitative mutations of the worker's task set is most definitely not always positive, the general trend has been an upgrading, not a de-skilling" (p. 13). Adler cites the example of numerically controlled machine tools to illustrate that maintenance, troubleshooting, and error detection, even and especially for advanced automation, require skilled operators with new training requirements. Attewell (1987) also documents that the de-skilling effect occurs only in limited and specific cases and that the aggregate skill level is rising.

These opposing views suggest that in fact both trends exist side by side, with significant rises in skill levels occurring in some occupations while others are experiencing the de-skilling effect. A shortage of well-prepared workers only serves to reinforce the de-skilling response.

Reorganization of Work

De-skilling of jobs is one possible response to skill shortages, and from the long-term perspective of maintaining a high quality work force, clearly the least desirable. Another is creative restructuring in the workplace that enables workers to learn more on the job, understand the whole system in which they are working, and take greater responsibility for decisions and outcomes on a group basis.

For instance, a key point in considering the relationship between new technology and training is that technology does not dictate absolute skill levels or the organization of work. Adler (1986) emphasizes that, instead, there is a range of possible skill configurations and room for managerial discretion in work design. Similarly, Kuttner (1983) observes that contrasts between the effect of computerization in different companies "suggest that management has considerable latitude in the way it applies technology to the tasks at hand" (p. 70). Hence, the quality of work that results from technological innovation may in large part depend on the way workers are

organized in relation to production. De-skilling, in essence, may often be attributed to management decisions.

Stephen Cohen (1987), Director of the Berkeley Roundtable on the International Economy, suggests not only that de-skilling is not a necessary result of advancing technology, but that it can often be attributed to preexisting skill shortages. Cohen says that U.S. firms tend to introduce technology in a way that eliminates the need for skilled labor because of preexisting skill shortages, the loss of competitive price advantage if companies have to absorb the full cost of training, and the historical precedent of labor-management hostility and Taylorism. Middle management remains resistant to increasing the skills, and hence the power, of workers lower in the hierarchy. The result is a strategy that treats technology as a substitute for a skilled work force instead of as a complementary element and thus tends only to perpetuate skill shortages.

Alternatives could be tried on a more widespread basis. Cohen reaffirms Adler's point that identical technologies can be applied in various configurations according to the organization of worker responsibility, yielding radically different results. A more highly skilled work force permits choice in work design and approaches that best meet both productivity and quality of work objectives.

The solution to the de-skilling problem, according to Cohen, thus lies in raising the skill level of the work force through greater investment in education and training. This is because the demand for skills is not independent of the availability of those skills:

> Skill availabilities and the general level of education interactively . . . shape the demand for the skills and know-how required to successfully implement new technologies. . . . [T]he skill and knowledge base of our economy . . . is . . . a major determinant of the technological and competitive evolution that itself determines demands for skills. [Therefore] educational policy that develops a highly skilled and educated workforce can create an enduring comparative advantage for the U.S. in the production of goods and services which embody that labor. (Cohen 1987, p. 67)

If Cohen's position is correct, then skill shortages will negatively affect productivity and competitiveness as well as future demand for skilled labor. Extensive substitution of capital for skilled labor can only be a short-term fix without severely damaging the economy. Although there are innovative forms of work design that are currently being implemented in a number of contexts (see, for example, Hirschhorn 1985, Trist 1981, Weisbord 1987), the lack of adequate education and training will perpetuate the proliferation of low-skill jobs, while limiting the extent to which firms can take advantage of new production techniques.

Implications for Education and Training

The new possibilities for innovative modes of work organization and greater worker responsibility for decision making cannot be realized unless the work force possesses wider ranging and more abstract abilities. With these qualitative changes, the education and training levels necessary for work clearly rise.

Perhaps the most significant adaptation of training is required by the qualitative shift toward the need for

higher-order reasoning, problem-solving, and analytical abilities in the workplace. As the term "skill" is broadened to imply not only basic literacy and technical knowledge but also adaptability, learning on the job, problem solving, and teamwork, the implications for education and training go beyond the de-skilling debate. Barton (1983) makes the case that "with the rise of work teams and other forms of participatory management, the future of training curricula will be influenced by the need for workers who have the necessary skills to participate in problem solving and decision making and a greater premium will be placed on broad preparation as compared to narrower skill training" (p. 29).

A similar need in manufacturing and the service sector may arise from the shift from mass production to "flexible production" (Berryman 1987). Workers in both sectors now need more systematic and abstract knowledge, flexibility, creativity, and an ability to work cooperatively with others. Berryman summarizes the qualitative impact of microelectronics:

> The result is not just new machines to master but a much deeper change in the way production is organized and ways that workers relate to the production process and to each other. . . . Asking whether work requires "more" or "less" skill inevitably focuses the analysis on limited and often secondary aspects of the transformation underway. Productivity gains are coming as much from changing the way that workers work together, their orientation towards their work, and the nature of their responsibility and involvement in the firm's changing strategy and orientation towards the market as from applications of new technology. (pp. 6-7)

Adler (1986) identifies a similar set of qualitative changes brought about by automation and innovation: greater task responsibility, a new degree of abstractness, and new levels of interdependence among tasks and responsibilities within a work system. How these new skill needs will be met poses a challenge to the education and training system. Beyond well-documented deficiencies in basic skills, students at all grade levels are often deficient in higher-order skills.

Although new technology and the shift to services are eliminating many jobs and creating new ones, new approaches to training will be key factors in adjusting the work force to new demands, equalizing the structure of opportunity, and taking advantage of the potential for innovative work design that will enhance both skills and productivity.

In summary, the basic literacy issue and the failures of education are being brought to the forefront of public attention as businesses are forced to recruit from the "marginal" labor force. It is becoming critical for society and for the economy to meet the educational needs of less-advantaged students and workers. Despite a high labor demand in many growing industries, as the general educational level of the population rises and as the skill requirements for new jobs change, those who are poorly prepared are in danger of falling far behind and being forced into the most marginal jobs or left unemployed, while an excess demand for skilled labor persists.

Demographic pressures on the labor supply, combined with structural changes in employment and changing skill requirements, are creating an unprecedented demand for expansion and improvement in both the public and private delivery of education and training. This improvement and expan-

sion can be greatly facilitated by institutional collaboration between the public and private training sectors in ways that pool and focus resources and tie training more closely to the changing workplace.

JOB TRAINING: BACKGROUND AND INSTITUTIONS

The enactment of the Job Training Partnership Act in 1982 marked a shift in public policy toward joint efforts with private industry. However, the origins of private sector influence and involvement in job training policy and debate about business involvement in vocational education date back to the Smith-Hughes Act of 1917.

The 19th Century

After the Industrial Revolution brought about the decline of the apprenticeship system as the primary mode of manual skill transfer, educators began experimenting with forms of school-based training. The earliest legislation formalizing school-based training was the Morrill Act of 1862, which established the first land-grant colleges and universities, providing postsecondary education for the nation's agricultural workers.

The next major development was the Manual Training Movement pioneered during the 1870s and 1880s by John D. Runkle, President of Massachusetts Institute of Technology, and Calvin M. Woodward of Washington University in St. Louis. Runkle and Woodward worked to make manual instruction, primarily in drawing, woodworking, and metalworking (cooking and sewing were added later), an integral part of public education curricula. The first programs to implement this idea were modeled after the Moscow Imperial Technical School workshops that were demonstrated at the 1876 Philadelphia Centennial Exposition. Introduction of manual education into the schools was expected to give learning a practical base, instill traditional values, and enhance industrial progress. By the end of the 19th century, the vast majority of school curricula included some form of manual training (Lazerson and Grubb 1974).

The Manual Training Movement, however, failed to gain enough support as it was perceived to lack relevance in the workplace (ibid.). Based on a belief in conveying general principles that were applicable to any work situation, manual training was soon displaced by the view that learning had to impart specialized skills that would directly serve the new industrial society. The economy needed workers who could run and repair machines, supervise assembly lines, and organize management. In the early 1900s, private industry and labor began to speak out, through the National Society for the Promotion of Industrial Education (NSPIE), against manual training and for national industrial education that would directly provide the skilled workers expanding industries needed.

Vocational Education

In 1917, Congress passed the Smith-Hughes Act, establishing the public vocational education system and creating the Federal Board of Vocational Education to oversee it. The act's passage was accompanied by considerable debate as to whether the system should be under public or private control and whether it served the goals of demo-

cratic education or offered merely a second-class education that reinforced social stratification (Lazerson and Grubb 1974). John Dewey argued strongly against separating vocational education from the integrated public education system, and labor fought against private business interests taking a dominant role lest this limit the educational development of young workers to serving only the needs of employers (Becker 1982). In the end, the Smith-Hughes Act established a differentiated vocational curriculum within the public schools.

The vocational education system dominated public work force training during the 1920s, 1940s, and 1950s. During the Depression, private sector interests took a back seat to the federal employment programs of the New Deal. In the other years, the focus remained on meeting skill demands to ensure economic growth.

The Smith-Hughes Act stood until 1963 when passage of the Vocational Education Act reoriented the vocational education system. The Vocational Education Act (VEA) broadened vocational education's coverage "so that persons of all ages in all communities of the State--those in high school, those who have completed or discontinued their formal education and are preparing to enter the labor market, . . . [those who] need to upgrade their skills or learn new ones, those with special educational handicaps and those in post-secondary schools, will have ready access to vocational training and retraining which is of high quality" (Vocational Education Act, Sec. 101). Job training was viewed as a policy tool for enhancing social equity through greater and more equal access to economic opportunities. Private sector interests were again deemphasized and the locus of vocational education remained in the public schools. The VEA thus mandated a shift in focus from satisfying skill demands to meeting the career development needs of individuals (Doeringer 1981). Further amendments in 1968 and 1976 targeted funds to serve the training needs of disadvantaged groups. Then, in 1984, the Carl D. Perkins Vocational Education Act replaced the VEA, placing even greater emphasis on the needs of specific groups.

Federal Job Training Legislation

One year before passage of the Vocational Education Act of 1963, the Manpower Development and Training Act (MDTA) of 1962 was enacted. MDTA was aimed not at secondary vocational education but at providing out-of-school training particularly for skilled workers displaced by automation. The act was later amended to target unskilled unemployed persons and minorities. MDTA was the first large-scale federal training effort. It brought new focus on specific disadvantaged populations and increased the use of on-the-job training programs as a complement to classroom training. The latter opened up avenues for private sector influence on the focus of training. It did not, however, address the business community's complaints about the inadequate work-readiness of many trainees.

A second major development in job training during the 1960s was the federally supported National Alliance of Business Job Opportunities in the Private Sector Program (NAB-JOBS) set up in 1968. This program marked the federal government's formal adoption of the goal of directing benefits toward specific disadvantaged groups. NAB's role was to solicit pledges of job slots from individual firms. Firms hiring disadvantaged employees were compensated for the costs of hiring and training.

The Comprehensive Employment and Training Act (CETA) of 1973 replaced MDTA and further expanded training programs outside the schools. It provided subsidized work, with the aim of improving economic opportunity for disadvantaged groups. A major goal of CETA was to reduce unemployment through public service employment (PSE) programs. It also gave more control over employment training activities to local governments.

The two major problems with CETA were the high cost of providing jobs for substantial portions of the disadvantaged population and the occasional abuses of PSE, which damaged CETA's image as a viable program. Thus, by 1978, strategies that worked through the private sector in addressing structural unemployment problems were gaining support. The 1978 CETA amendments included the Private Sector Initiatives Program, which established the first Private Industry Councils (PICs) for formally involving businesses in the job training system.

The perceived failures of CETA's public sector employment approach, the establishment of the PICs, and growing fears about the United States' economic position set the scene for a fundamental shift in policy focus toward supporting private sector initiatives. The response in the early 1980s was to reemphasize the federal education and training policy goal of ensuring economic growth by meeting the skill needs of business and industry. This time, however, the private sector would take a more active role in the delivery of training and would have greater control over the implementation of programs.

Major Job Training Institutions

The public education and training "system" consists of federal job training programs under JTPA, vocational education authorized under the Carl Perkins Act, and the public school system and community colleges. These disparate programs operate in a diverse environment of alternative sources of training.* Recent legislation has tended to encourage and even mandate some kinds of cross-agency cooperation among federal programs. Nevertheless, the purposes of the different laws have remained fundamentally distinct; given the diversity of institutions involved in training, it would be misleading to suggest that federal efforts reflect a coherent employment and training "policy."

JTPA

The Job Training Partnership Act (JTPA), passed in 1982, replaced CETA and redirected federal employment and training away from public service employment to a renewed emphasis on job skill training and an expanded role for the private sector. JTPA requires partnership between local public and private interests for its implementation. Training programs are funded and administered through local Private Industry Councils (PICs). A minimum of 51 percent of council representatives must be selected from local business leadership. Business leaders work together with other representatives from education, labor, and the general community to develop training programs that will provide low income, unem-

*Hodgkinson (1986) notes that the kinds of educational alternatives available to people after high school are much broader now than 20 years ago. Education and training can be acquired from sources ranging from corporate colleges and labor union colleges to apprenticeships, the military, and private employers, as well as the more conventional public and proprietary educational institutions.

ployed, disadvantaged, and dislocated workers with skills that match local employment demands. Locally administered JTPA programs provide on-the-job training, customized training, retraining, dislocated worker training, and preemployment training. A full 70 percent of allocated funds must be spent on training programs.

Specific training provisions for disadvantaged groups under JTPA include the following:

- **Title II Training Services for the Disadvantaged.** Basic training services for economically disadvantaged youth and adults are authorized under Part A. Summer youth employment and training programs for disadvantaged young people are authorized under Part B. Forty percent of funds must be spent on services for youth between the ages of 16 and 21. Many states and localities have had considerable difficulty in meeting this requirement.

- **Title III Economic Dislocation and Worker Adjustment Assistance Act (EDWAA).** The dislocated worker program is designed to assist workers who have been laid off or received notice of termination, in addition to the long-term unemployed. Eighty percent of funds are allotted on a formula basis to states.

  The act now provides for a mandatory substate delivery capacity, similar to that under Title II, to which states must allocate 60 percent of funds. The law also changes the composition of the State Job Training Coordinating Committees. Now each must consist of 30 percent business and industry, 30 percent various state agencies, 30 percent organized labor and community groups, and 10 percent general public representatives. The law also creates a mandatory "rapid response capability" on the part of the state to respond to plant closings and substantial layoffs.

  Fifty percent of substate funds must be used for retraining services. Other services include basic readjustment and needs-related payments to individuals receiving training.

- **Eight Percent Set-aside.** Eight percent of Title II-A allotments to states is marked for state education programs. At least 80 percent must be used for services for eligible participants under cooperative agreements between state and local education agencies and JTPA administration, and 20 percent for coordination activities.

The Carl Perkins Act

The Carl D. Perkins Vocational Education Act replaced the Vocational Education Act of 1963 in October 1984. Major objectives of the Perkins Act are to promote greater cooperation between public agencies and the private sector in preparing individuals for employment and to make the vocational education system more responsive to the labor market. The act also places greater emphasis on the needs of disadvantaged students and provides for cooperation with community-based organizations. In 1988, the act provided almost $900 million in federal assistance to states to support vocational training in public high schools, community colleges, and other postsecondary institutions. Most funding for vocational education, however, comes from state and local sources. The Carl Perkins Act is similar to JTPA in requiring cooperation among implementing agencies, and states must coordinate vocational education programs with JTPA programs.

Funding priorities under the Perkins

Act are briefly summarized as follows:

- **Title IIA Basic Grants.** Funds may be used for basic literacy instruction, vocational education and skills training, placement services, related supportive services, and equipment. States may contract with local education agencies (LEAs) or postsecondary institutions that in turn can contract with community-based organizations. Basic grant funds are required to be targeted as follows: 22 percent to the disadvantaged, 12 percent to adults in need of training and retraining, 10 percent to the handicapped, 8.5 percent to single parents and displaced homemakers, 3.5 percent to individuals in programs designed to eliminate sex bias and stereotyping, and 1 percent to criminal offenders. Beneficiaries may be either economically or educationally disadvantaged.

- **Title IIB Program Improvement, Innovation, and Expansion Grants.** Title IIB funds may be used to expand programs for out-of-school youth, to provide prevocational training, and to set up new vocational education programs. LEAs and postsecondary institutions are funded and may again subcontract with community-based organizations.

- **Title III (Special Programs) Part A. State Assistance for Vocational Education Support Programs by Community-Based Organizations.** The objective of this provision is to increase the participation of high-risk students in vocational education through local partnerships with community-based organizations.

The Carl Perkins Act expires in September 1989 and is up for reauthorization.

Community Colleges

There are more than 1,200 community colleges, technical schools, and junior colleges enrolling approximately 5 million students in credit courses and an additional 4 million in noncredit courses (El-Khawas, Carter, and Ottinger 1988). Community colleges are funded by a combination of state and local education funds, federal vocational education money, grants, tuition fees, and, more recently, by contract arrangements with the local private sector. Community colleges are accessible and inexpensive, and they have the flexibility to respond to changing community needs. They enroll a wide variety of students, including full-time matriculants in degree programs, part-time working people, and full-time workers in continuing education, supplementary, and upgrading courses. Crawford (1984) reports that, "historically, community colleges have been especially aware of their responsibility to those people who have been on the periphery of educational opportunities because of their limited financial resources or their socio-economic status" (p. 121).

Curricula extend from full-credit college parallel and vocational-technical classes to continuing education for adult students, remedial education and General Educational Development preparation, and special programs developed in partnership with local business and industry. In addition, many community colleges administer JTPA programs.

Proprietary Training Institutions

Proprietary schools, or private occupational schools, are for-profit institutions that provide postsecondary occupational programs. These schools have been formally recognized as a part of the postsecondary educational system since the education amendments of 1972.

Proprietary schools can contract with local education agencies to provide vocational training with support from the Vocational Education Act.

There are an estimated 6,000 such schools, enrolling approximately 3 million students. Lerner (1987) notes that because they are operated on a profit-seeking basis, these schools have been held in low esteem by the education establishment. This view is unfounded, he maintains, since the majority of proprietary schools now operate in excellent facilities with up-to-date equipment, have faculties with practical experience in their field, and are closely in tune with the local labor market. Furthermore, most are accredited by national associations, such as the National Association of Trade and Technical Schools or the Association of Independent Colleges and Schools.

There has also been a recent movement toward further integrating proprietary schools into the education system through transferability of credits, dual enrollment, sharing of facilities, and joint appointment of faculty with community colleges and vocational programs (Lerner 1987).

Employer-Based Training

The American Society for Training and Development (ASTD) estimates that the value of employer-based training in the United States is $210 billion annually (Carnevale 1987). This figure includes formal programs and informal on-the-job training and is roughly equivalent to the size of all the public elementary, secondary, and higher education systems. Employer-based training is a large and critical part of society's training delivery system, especially because 75 percent of all workers who will be in the labor force in the year 2000 are already in it.

Four functional categories of training commonly provided by employers are basic skills or remedial training, essential job-related instruction or skill upgrading, retraining for new technology and worker readjustment, and general human resource development. More and more companies are finding that they must provide remedial education to their employees, though this is conventionally viewed as a public sector responsibility. For example, the Aetna Institute for Corporate Education offers employees and potential employees a curriculum in basic business skills, including reading, math, writing, oral communication, and computer skills (Lee 1988).

Internal retraining, in addition to entry-level training, is becoming more common. In fact, as the pace of technological change quickens, the two are ceasing to be independent. Although internal retraining has strong political and social appeal in that it contributes to job security, there is evidence that it also makes sense economically. The December 1987 issue of the *Work in America Bulletin* cites research finding that the cost of retraining is often less than the cost of firing/hiring when new skills must be provided (Work America Institute 1987).

Another growing phenomenon in employer-based training is the "corporate classroom." There are as many as 30 planned or operating degree-granting programs run by private corporations, such as the General Motors Engineering and Management Institute and the Wang Institute of Graduate Studies. In addition, over 200 corporations offer degree programs in cooperation with a college or university. Several labor unions have also established their own degree-granting colleges.

PUBLIC-PRIVATE COLLABORATION IN TRAINING

Public-private linkages are a means of improving the quality and relevance of job training. Arguments for the need for better and more linkages have been made from two perspectives: improving national economic competitiveness and increasing equity in access to the job market for disadvantaged groups. It appears, given the looming shortage of skilled labor, that the interests of the economy and of individual equity are converging as the need for better and more widely distributed skills grows.

In establishing public-private linkages for training, there are several issues around which interested parties can find common ground. These include better trained employees and higher placement rates, higher labor productivity, stronger economic competitiveness, local economic development, job security, and such social benefits as increases in tax revenues, decreases in social ills as a result of better employment conditions, and greater community cooperation in addressing common problems.

In this section, the rationale for public-private linkages from both national and individual perspectives is presented. A discussion of institutional cooperation follows, and potential forms that public-private cooperation may take are described and illustrated.

The Rationale for Collaboration

Concern over the growing mismatch between labor supply and demand has given rise to a search for collaborative solutions. Because the essential problem is a mismatch between the skills that education and training deliver and those that employers require, strategies are needed that coordinate information, knowledge, and resources from both providers and users of these skills.

Economic Competitiveness

Currently, strong arguments are being made that public-private linkages will help address the pressing need to maintain U.S. competitiveness in the global economy. Meyerson and Zemsky (1985) maintain that an economic environment characterized by informal on-the-job training and considerable remoteness between business and education will no longer suffice. In September 1987, Congress convened hearings on "Competitiveness and the Quality of the American Workforce" before the Subcommittee on Education and Health. The hearings reflect the growing concern for international competitiveness and economic productivity in motivating educational reform and improved skills training. This represents a fundamental shift from the focus on social aims under the Carter administration. Now, the primary purpose of private sector involvement in education and job training is explicitly to promote productivity in individual firms and the national economy as a whole. Further, Carnevale (1987) notes that "until now, public policy considerations have . . . focused on the disadvantaged job seek-

er. The recent national interest in competitiveness . . . has brought an additional dimension to the national human resources debate. We are now interested in the employed as well as the unemployed population" (p. 88).

The basic argument in favor of public-private training linkages from the perspective of national economic competitiveness is that in order to maintain high U.S. wages and the standard of living, while still competing in international markets, labor productivity must rise. Labor productivity can be raised through capital-intensive investment in new technology and through training investment in worker skills to apply that technology to efficient production. Efficient production requires a work force that is educated and trained well enough to minimize costly errors, to adapt quickly to advancements in technology, and to learn on the job.

Human Capital

Human capital refers to the productive capabilities that workers acquire at some cost, whether their own or their employer's, and that has a price value in the labor market. (For a complete discussion of education and training as investment in human capital see Parnes 1985.) Human capital theory states that there is a profitable return on investment in education over the productive life of an individual. Originally an argument for personal investments in education that produce higher levels of income, human capital theory also argues for industry investment in well-trained employees and national investment in a well-trained and hence productive work force.

As training requirements rise, human capital increasingly takes on the economic characteristics of a fixed capital asset requiring substantial initial investment. "This is in recognition of the small part of wages and salaries in advanced economies that is attributable to 'raw' human labor, and the correspondingly large part that is attributable to investment in humans: education, on-the-job training, health, and so forth" (Becker 1971, p. 160).

Human capital theory thus implies the need for cooperation between private industry and public education and training as an efficient approach to meeting "investment needs." The resources for producing a high quality work force are distributed through both the public and private sectors and therefore require dual public and private efforts. In other words, both sectors are to benefit from the returns on training investments, and those returns will be maximized if the linkages between occupational preparation and labor market demands are improved, ensuring that training is responsive to the changing demands of the workplace.

The authors of *Building a Quality Workforce* (1988) report that the lack of appropriate skills in the work force is "costing American business monetarily, through waste, lost productivity, increased remediation costs, reduced product quality, and ultimately a loss in competitiveness" (p. 18). In the absence of an effective collaborative strategy to close the skills gap, the prognosis is bleak. Employers will be forced to choose among the following alternatives:

1. Employ under-qualified workers, which could result in inferior product quality, thus reducing our ability to compete in global markets

2. Competitively seek out qualified workers already employed in other companies, thus driving up the wage scales and reducing our price competitiveness

3. Expend massive resources to remediate workers

4. Take the jobs elsewhere, thus reducing American opportunities and eroding our economic base (ibid., p. 19).

The perpetuation of the skills mismatch is attributable largely to the lack of responsiveness to change on the part of education and training. Addressing the mismatch by improving the responsiveness of training requires a collaborative solution that draws together business and industry needs and opportunities with the providers of training and education.

Regional and Local Economic Development

Public-private training linkages also work to promote economic development on a more localized scale. As skill requirements are met, firms are encouraged to remain or locate in the area, contributing to local economic development. Moss (1983) confirms that many states use training capability as an incentive to attract businesses. It is in the interest of state governments to cooperate with employers and job training institutions in meeting the dual conditions for economic development--job creation and an available pool of well-trained workers. Clinton (1987) maintains that "dramatic productivity gains could be achieved by developing stronger ties between state human resources and economic development strategies and the decisions businesses make on training" (p. 375). Further, the capacity for upgrading worker skills through retraining prevents displacement and reduces the public and personal cost of worker readjustment.

However, policy that encourages job training partnerships cannot be viewed as a panacea for solving local economic problems. Although the availability of skilled workers is an attraction for business, other economic forces may be beyond the influence of training policy. Doeringer (1981) conveys the inevitable limitations: "Ultimately, the success of programs to prepare individuals for work is constrained by the structure and number of jobs in the economy. Unless full employment, local economic development and equal opportunity are actively [and concurrently] pursued, even the best designed education and training system will continue to produce a work force that suffers from underutilization and inequality" (p. 17).

Social Equity

Recent demographic shifts show that employers will now have to hire an increasing proportion of their workers from minority and disadvantaged groups. As a result, the education and training interests of the national economy and of the individual are converging. This will be facilitated if the knowledge and abilities employers need are spread more equitably through the population.

Greater cooperation between the public and private sectors can further this effort. The extent to which public-private partnerships serve the interests of the individual trainee, however, is not always readily apparent but may depend on questions of priority and control in meeting stated objectives. The movement of national policy in the 1980s has been gradually away from the emphasis on individual and social concerns of the Manpower Development and Training Act in the 1960s and CETA in the 1970s. JTPA has placed more control in the hands of private industry through decentralization to PICs. The positive effect has been to tie job training to concrete job opportunities. The negative effect has

been to encourage "creaming" of the most easily trainable. The result is that the needs of the most disadvantaged groups often are not targeted.

In order to improve equity of access for disadvantaged groups in the job market, it is essential that public training efforts be closely connected with businesses to ensure real opportunities for beneficiaries. The needs of individuals for greater opportunity are often best met through innovative programs that closely connect public support with private sector resources. The capacity of conventional education and training to solve equity problems assumes that a single competitive labor market exists and that people with equal skills will have equal opportunity.

Those who differ with this neoclassical conception of labor markets argue that in fact a dual labor market system exists in which perfect competition among job seekers is impossible. Piore (1975) describes primary and secondary labor markets: the primary sector "offers jobs with relatively high wages, good working conditions, chances of advancement . . . and above all employment stability. Jobs in the secondary sector, by contrast, tend to be low-paying, with poorer working conditions and little chance of advancement . . . and characterized by considerable instability and a high turnover among the labor force" (p. 126). Mobility between primary and secondary labor markets is blocked by structural factors such as location or residency, access to high quality education and training, and also by race and sex discrimination. Increasing skill requirements, the loss of natural promotional ladders, and reductions in manufacturing jobs are also making mobility within and across labor markets more and more difficult.

From this viewpoint, it is questionable whether closing the gap between public and private training will, in itself, go far toward closing the gap between the income levels and unemployment rates of the advantaged and disadvantaged segments of society. A critical goal of public-private linkages, therefore, must be to provide more equitable access to training that will provide disadvantaged groups with the necessary skills to get good jobs and contribute needed productivity to the economy.

A further issue to consider with regard to public-private partnerships is the primacy of emphasis on meeting employers' training needs. According to Becker (1982), allowing employers to prescribe opportunity creates a solution "devised in terms of fitting the peg to the hole, or assisting the individual to meet the demands of employers" (p. 7). The alternative approach would follow John Dewey in questioning the validity of education or training that is a servant of the labor market. It would emphasize instead that "education is an end in itself and that the purpose of cooperative program planning . . . is to make better use of the broader community in the educative process" (Silberman 1982, p. 299). Silberman argues further that, in the long run, the educational perspective may offer greater opportunity for economic development than the labor supply approach, which uses work experience to impart job skills specific to a single company. "General competence may be more important than specific technical job skills" (ibid.).

Silberman's conclusions are consistent with the perspective of Resnick (1987) and others who maintain that the essential ingredients of a high quality work force in the future are more general, higher-order thinking and adaptive abilities. In planning public-private training arrangements, a critical balance must be struck between the

immediate production skills required and the general development of human resources. Too much emphasis on one imperils economic growth; too much on the other curtails individual access to education and thus workplace opportunity.

Institutional Cooperation

Institutional cooperation occurs not in policy but in practice. Public-private training linkages are implemented through collaborations between specific institutions or general agreements among several institutions and sectors of a community that are concerned with training. Greenwood, Skinkle, and Larson (1981) note that--

> apart from economic crises and political preferences regarding private sector involvement in job training, there are multiple advantages to job training/private sector partnerships that remain constant over time. Such a relationship results in mutually satisfactory benefits to the society, the private sector, the job training system, and the individuals enrolled in occupational training programs. The benefits are both direct and indirect, and perhaps will be of a long-term nature rather than immediate. (p. 7)

Thus, collaboration can mutually benefit firms, trainers, schools, and individuals by better matching training to skill needs. Although each stakeholder will have a different perspective on the need for cooperation and may have reason to exercise caution when entering into collaborative relationships, the positive effect shared responsibility and pooled resources will have on the wider social and economic environment should more than offset such concerns.

Barton (1983) observes that "the distance between the classroom and the workplace remains large in many sectors of formal occupational education . . . the kind of skills that require long lead times to develop . . . continue to grow in number. . . . The half-life of early occupational training compresses and a continual interplay of formal education and experience becomes necessary throughout a career" (p. 28). It is at the level of specific institutional cooperation that this distance can be reduced. Cooperative endeavors will benefit vocational training by making graduates more marketable, increasing access to training resources, and enhancing public image. Similarly, employers will benefit from having greater control over the quality and supply of labor. From the perspective of private employers, the rapidity of technological change mandates that education and training be closely tied to the workplace, enabling firms to use new technologies competitively through retraining and hiring according to new skill levels. Smaller firms, a principal source of economic growth, can benefit especially from cooperative training arrangements because they frequently do not have the capacity to provide internal training.

A principal lesson of the CETA era is that training not directly related to actual jobs is ineffective and has little overall impact on the level of unemployment. In fact, the record over the last decade has shown that job training alone will do very little to improve local employment conditions. Even though the availability of skills to some extent co-determines labor market demand (by enabling industries requiring those skills to grow), jobs create the demand for skills and not the other way around. Therefore, it is essential that specific employers and job opportunities be linked to specific training programs so that the content of those programs is as responsive as

possible to local labor markets. Links between institutions can make use of the occupational information that would be made available through networks, such as a Community Occupational Information Coordinating Committee (see appendix).

Job training and educational preparation for work have a greater chance for success when conceived with reference to the local economic environment. Context-based planning for training cannot be accomplished by individual institutions in isolation but must at least be informed by, and at best be jointly undertaken by, the relevant stakeholders in that environment.

Moss (1983) cites testimony from the reauthorization of the Vocational Education Act by the U.S. Chamber of Commerce, which emphasizes that "educators could not prepare their students for the rapid change of tomorrow's labor market unless there is close communication, understanding and partnership between the business and education communities" (p. 71). Similarly, Silberman (1982) states that "most policy makers agree that the effective development of vocational skills in both young and adult members of our society cannot succeed through the lone efforts of the public schools. The very nature of the task requires the cooperative efforts of employers, unions, government, education and other community-based organizations, each performing what it does best" (p. 279).

Forms of Collaboration

Efforts to link public and private sectors in the broad-based and extensive local cooperation necessary to sustain programs and to have long-term and substantial impact on the quality of the work force have met with limited success to date. Yet many individual collaborative initiatives that are now being tried have successful elements and hold valuable lessons for further efforts to build partnerships.

The examples that follow lay out some of the most promising kinds of partnerships currently in operation. They are few and small compared to the magnitude of effort that is required, but they do indicate the direction that collaborative alliances must take if they are to improve opportunities for the disadvantaged and the quality of the work force.

Cooperative endeavors can be grouped into two broad categories. The first category includes open-ended collaborative arrangements that have general, long-term goals, such as creating opportunities for at-risk youth or increasing business participation in education. The second category includes shorter-term arrangements intended to meet specific training needs. This listing does not attempt to be exhaustive or to evaluate the programs described.

Open-Ended Collaborations

Open-ended collaborations are cooperative efforts among two or more institutions that set broad, long-term goals. Examples of open-ended collaborations are industry-education councils, local education funds, school-business partnerships and quasi-public skills brokering corporations.

Industry-education councils. Also called business-industry-education councils, these are a broad-based form of collaborative structure. An industry-education council serves to bring together diverse resources from a community to address issues of educational quality. A council is a permanent umbrella for coordinating and promoting local collaborative efforts. Its members are representatives from educa-

tion, business, industry, organized labor, and local government.

Although industry-education councils vary widely in their specific composition and activities, their purpose is usually to provide a broadly representative advisory council that focuses community resources on improving education and linking schools more effectively to local labor market demands. A general model for industry-education councils has been promoted by the National Association for Industry-Education Cooperation (NAIEC).

Clark (1983) feels that permanent collaborative organizations, such as industry-education councils, are the best vehicle for maximizing the benefits of cooperation in improving employment preparation and opportunities for disadvantaged youth and adults. Although the structure is conducive to a high degree of collaboration, the effective degree of interaction among public and private representatives on these councils--and the extent of their local impact--is difficult to generalize.

In 1984, there were more than 150 councils across the country. Many of these are noted in the 1981 National Institute of Work and Learning publication *Industry/Education/Labor Collaboration: A Directory of Local Collaborative Councils.* Many of these still exist in their original form, but the majority have been transformed or subsumed under new partnership activities.

Local education funds (LEFs). A local education fund is a third-party, nonprofit organization that acts as an intermediary in developing community and private sector support for public school improvement. LEFs have been established in many cities and communities throughout the country, particularly in areas where lack of public support is threatening the quality of education. The funds operate as independent, neutral channels, directing support to where it is most needed.

Some examples of LEFs are the Allegheny Conference Education Fund in Pittsburgh, the Los Angeles Educational Partnership, the Educational Enrichment Foundation in Tucson, Arizona, the Alliance for Quality Education in Greenville, South Carolina, and the Oklahoma City Public School Foundation. There are many others.

The success of local education funds prompted the formation of a national nonprofit organization called the Public Education Fund (PEF). PEF was established in 1983 with a 5-year mission to provide technical assistance and develop grant support to 40 LEFs in different cities. As of January 1, 1988, the Public Education Fund Network (PEF/NET) became the successor organization, continuing support to former grantees and providing technical assistance to other groups interested in forming new LEFs.

School-business collaborations. School-business collaborations involve one school or a whole school system in formalized relationships with the local business community. School-business partnerships have received a great deal of attention as the successes and shortcomings of the Boston Compact have been publicized. The dual goals of school-business partnerships, as a strategy for involving business in public education, are to improve the quality of education and to connect students with employment opportunities.

Many partnerships focus either directly or indirectly on disadvantaged youth, in response to a growing concern that schools are not adequately preparing these students. In 1987, Public/Private Ventures (P/PV) published *Allies*

in Education (McMullan and Snyder 1987), a national assessment of school-business partnerships, which found that most cases fit into one of three models: the pairing of a business or group of businesses with a single school (examples include the Tenneco/ Jefferson Davis Business School Partnership in Houston and the Primerica/ Martin Luther King, Jr. High School Partnership in New York City); collaborative efforts that focus on entire educational systems (examples include the Boston Compact, the Atlanta Partnership of Business and Education, and the statewide California Regional Occupation Centers and Programs); and collaborations focused on developing the employability of economically disadvantaged youth (examples include the Off Campus Work/Study Program in St. Louis, New Horizons in Richmond, and Teen Opportunities Promote Success in Birmingham).

The growing willingness of business and education to enter into collaborative efforts is a positive movement in itself. Levine and Trachtman (1988) offer an optimistic analysis of school-business alliances:

> There has been a real and fundamental change in the level of business involvement with the schools. Where earlier efforts in this century focused on vocational education and narrow skill development, business has now turned its attention to the need for more broadly, liberally educated employees. Where business once advocated techniques that produced schools modeled after factories, many businesses have now learned that participatory management and leadership that empowers people can lead to far greater productivity. (p. xxiii)

In most cases, the private sector role is one of providing advice, additional funds and equipment, political support, or internship opportunities for students. McMullan and Snyder's (1987) assessment concluded that school-business collaborations show strong potential for playing key roles in addressing educational reform and serving at-risk youth, yet so far the programs have met with only limited success.

On the negative side, school-business collaborations have been criticized as being strong on rhetoric and weak in substance. There is often resistance in public education to allowing private sector interests to influence curriculum design or other school reform measures. McMullen and Snyder found that school-business partnerships have been ineffective in producing fundamental changes in the education system such as improving curricula or decreasing dropout rates. Donald Clark of the National Association for Industry-Education Cooperation states--

> many business representatives and educators do not fully understand the real reason for a partnership or the scope and enormity of what must be done to implement an effective business-education alliance. . . . Most partnership activities are brief, episodic, involve low-level investment, have limited objectives and are conducted on a fragmented . . . and duplicative basis. ("Business-Education Partnerships" 1988, p. 6)

Nevertheless, the school-business partnership experience in generating support from businesses and their shortcomings on the education side can inform future collaborative efforts that seek to link business and education. The recent publication, *A Guide to Working Partnerships* (Lacey and Kingsley 1988), focuses on practical implementation issues for establishing successful partnerships. The guide is

based on experience with the Partnership Project--a network of 21 work-education partnership programs fostered by the Edna McConnell Clark Foundation. The Boston Compact is described as a case example later in this section.

Quasi-public skills corporations. These organizations are created by states to administer job-specific training programs. Representatives from business, labor, and education sit on the boards of directors. Major program objectives are to build business-education partnerships that will outlast any short-term programs and to increase the relevance and responsiveness of public education institutions.

The Bay State Skills Corporation in Massachusetts was the first of these organizations. Similar skills corporations have been modeled after it in Kentucky, Minnesota, Washington, and Florida. Since these organizations exist outside the traditional state agency structure, they have the flexibility to develop new ways in which states provide employment and training support. For instance, the corporations are able to draw upon professional expertise in fields not available within state agencies, experiment with different financial arrangements for the delivery of services, and forge collaborative relationships between state education and training activities, the private sector and state economic development initiatives (Ganzglass and Heidkamp 1987).

Project-Specific Collaborations

Project-specific collaborations are defined as those cooperative efforts intended to meet more narrowly defined, short-term goals such as specific skill needs. These collaborations often take the form of one-to-one relationships. Examples are state-funded employer-based training, contract training, and union training programs.

State-funded employer-based training. Many states operate programs that provide funds directly to firms, supporting employer-based training that directly addresses economic development objectives. Unlike federal job-training money, which is directed to specific populations in need, state-funded programs target specific companies. The programs are preventive in that they are geared toward economic expansion and avoidance of job loss rather than reemployment.

Funding arrangements vary widely from state to state. The various state programs are described by Ganzglass and Heidkamp (1987). Some examples follow:

- **The Michigan Job Opportunity Bank (MJOB)** provides retraining assistance to companies adapting to new technology and to individuals, enabling dislocated and potentially dislocated or underemployed workers to enroll in community college training programs.

- **Illinois' Prairie State 2000** is described in detail among the case examples later in this section. It offers both company and individual training support.

- **The California Employment Training Panel** provides $55 million per year to train and retrain dislocated and potentially dislocated workers. A major goal is to increase company productivity and prevent closings.

- **The New York Employer Specific Skills Training Grant Program** provides funds to educational institutions to do firm-specific training. Firms are required to provide matching funds or in-kind contributions. Twenty percent of slots must

be filled by dislocated workers and the economically disadvantaged.

Other examples cited by Ganzglass and Heidkamp are the Indiana Training for Profit and Basic Industry Retraining Programs, Iowa's New Jobs Training Program, Missouri's Job Training Development Fund, the New Jersey Jobs Training Program, the Customized Job Training Program in Pennsylvania, and the Washington Job Skills Program.

Contract training. Contract or customized training usually involves short-term arrangements between private firms and community colleges, technical schools, and sometimes universities to provide specific training services. Arrangements can range from hiring instructors to teach basic skills to buying predesigned training packages. Some schools, such as the Rochester Institute of Technology, have subdivisions that deal specifically with training for the local business community.

Joint labor union-management training programs. Unions also have been active, in cooperation with management, in making training available for their members by drawing on both company resources and public education funds. For example, the United Auto Workers (UAW) has worked to establish joint education and training programs for employees of Ford, General Motors, Chrysler, NAVISTAR, J. I. Case, Caterpillar, and John Deere corporations. Training programs are set up through negotiations with management. The corporation provides part of the funding, and the balance is covered by deductions from wages to cover training costs. UAW and other unions participate in the Consortium for Worker Literacy (described in the case examples), a unique union initiative to provide work-related instruction to members.

Case Examples

This section briefly describes 15 case examples that illustrate the various forms of collaborative alliances discussed. These represent a selection of the more well-established and promising programs in existence. Given the limitations of any single program, the experience gained from each offers valuable information regarding ways in which effective public-private collaboration may be established.

Open-Ended Collaborations

The Boston Compact. The Boston Compact is a unique school-business collaboration initiated in 1982 to encourage school improvement and employment of youth in the Boston area. It takes the form of a joint agreement between the community and the school system, setting performance goals for the schools, admissions goals for higher education, and employment goals for businesses. Specifically, the school system agreed to improve attendance rates and achievement scores and to reduce the dropout rate. Business agreed to hire a greater number of youth from the public schools. Higher education agreed to increase their admissions.

All participants in the Compact pledged to work toward these goals by providing technical assistance, political support, and increased employment opportunities. In 1988, the Compact is in its sixth year. Although it has been successful in generating employment and educational opportunities for students, it has fallen short in its goals for educational improvement.

Portland Investment. The Portland Investment Plan was conceived by and is implemented through the Portland (Oregon) Leaders Roundtable. The Roundtable comprises representatives

from local government, business, schools, organized labor, the Portland School Board, and local community colleges. The goal of the Portland Investment is to "effect long-term structural change that will reduce the number of school dropouts, enhance basic skills, provide greater access to jobs, especially for low income and minority youth" (*Building a Quality Workforce* 1988, p. 57). The Investment consolidates major youth employment programs in the county and stimulates increased private sector involvement to reduce dropout rates and improve access to jobs through school-to-work transition programs.

The Indiana Partners in Education Program. The Indiana Partners in Education Program (IPIEP) is a project of the Indiana Economic Development Council. It provides grants and technical assistance to enable communities to develop partnerships among business, education, and community interests. These partnerships aim to improve the economic vitality of the community, improve the employability skills and work readiness of young people and adults, and create a foundation for lifelong education and training for community members.

IPIEP provides incentive grants to stimulate further community investment in the partnership approach and concentrated program grants to efforts focusing on a particular area of concern, such as skill development for adult workers or dropout prevention/ re-entry promotion for students. Consultation and intensive management training are key elements of IPIEP's strategy, ensuring that community partnerships will be sustained in the long term.

Grantees must address one or more of the program's stated target objectives, as follows:

- o Improve student achievement in particular subjects
- o Increase the number of students continuing their education
- o Increase career and life planning skills
- o Develop curricula that are relevant to the future
- o Address educational needs of adult workers
- o Improve employability competencies
- o Prevent dropouts and promote re-entry
- o Identify and instructionally support high achievers

Other states that have committed significant funds to the statewide promotion of business-education-community partnerships include Alabama, Florida, and Colorado.

The Arizona Business and Education Partnership. Previously called the Arizona Business-Industry-Education Council, the Arizona Partnership has been working to build cooperation between the education and business communities since the early 1960s. It is one of the oldest collaborative organizations of its kind in this country.

The Partnership is a membership organization, funded primarily by the business community. A small executive staff is accountable to an executive advisory board and board of directors from business and education, as well as an education board and a mentor group of formerly active leaders. Partnership services include supporting other local partnership programs, brokering needs and resources, training for project coordinators, developing and implementing partnership programs, and

conducting research and dissemination of current information and new ideas. The Partnership also serves as the State Resource Center on partnership activities. A recent product is a series of task force reports released in 1988 focusing on at-risk students, entry-level employees, creative education, and the fiscal needs of schools.

The Los Angeles Educational Partnership. The Los Angeles Educational Partnership (LAEP) is a local education fund that channels private resources to strengthen the quality of education, particularly in the area's troubled inner city schools. Programs focus on such issues as changing demographics, teaching effectiveness, dropouts, education for advancing technology, and the increasing isolation of schools from the community. Specific programs are Small Grants for Teachers, Math/Science Teacher Fellowships, Professional Links with Urban Schools, Target Science, and Focus on Youth. The Focus on Youth program directly addressed the dropout problem among high-risk students by trying to reach poorly performing students at all grade levels with a spectrum of support services before they drop out.

Bay State Skills Corporation. Established in 1981 by the Massachusetts State Legislature, the Bay State Skills Corporation (BSSC) is designed to increase the supply of skilled workers in high growth fields. State funding is intended to be matched by private industry support. The corporation acts as a broker between industry and educational institutions to match training needs with training providers. It awards contracts to educational institutions, which develop partnerships with companies for joint training programs.

A broad spectrum of the population is served, ranging from people who are employed or in college to those who are on welfare, unemployed, or underemployed. BSSC administers four programs:

- **Industry Responsive Program** funds nontargeted training partnerships. The program requires a 50/50 public-private funding match.
- **Employment and Training Choices** is designed specifically to bring welfare recipients into the work force.
- **Bay State Centers for Displaced Homemakers** serve women who need counseling, education, and training assistance to become economically self-sufficient.
- **Special Institutes** update the skills of faculty from institutions of higher education with the assistance of industry in such areas as interactive videodiscs, computer-aided engineering, and fiber optics.

The Bay State Skills Corporation has served as a model for legislation proposed by Senator Paul Tsongas to create a national industry-education consortium.

California Regional Occupational Centers and Programs. The Regional Occupational Centers and Programs (ROC/Ps) are part of the California public schools, but are designed to provide an entire county or region with more vocational and technical job training than is possible at individual high schools. Their primary goal is to prepare teenage and adult students for employment. Since they are involved exclusively in occupational training, they are more flexible in responding to changes in the job market than the public school system as a whole.

Industry has been highly supportive of the ROC/Ps by participating in an advisory capacity both at start up and

during the operation of programs, by making business sites available for training, and through community classroom agreements that involve company employees in providing training and experience for students. Businesses are also involved in cooperative vocational education, providing paid job experience to students, donating supplies and equipment, maintaining contact with career guidance counselors, and in some cases providing instructors.

New courses are introduced only if projected job growth for that industry is documented. Teachers must have work experience in the industry for which they are preparing students. The ROC/P classes are available to students and out-of-school youth from all backgrounds as well as to adults and the handicapped. For adults, retraining and upgrading of skills are offered through short-term programs. Courses are set up or discontinued based on ongoing labor market analysis and industry involvement.

Consortium for Worker Literacy. Established in 1985 by eight unions in New York City to provide free educational programs to their members, the consortium represents the unions' combined efforts to meet the need for education in basic literacy and job-related skills on their own terms. The consortium has obtained funding from the State Department of Education, the Municipal Assistance Corporation, and the New York City Board of Education. The program offers courses ranging from basic literacy and English as a second language to job-related technical subjects and citizenship.

Project-Specific Collaborations

RIT Training and Professional Development. The Rochester Institute of Technology (RIT) maintains close connections with the local business community through its Training and Professional Development program. It offers consulting and training services to meet specific business needs. A recent training liaison has been between RIT and Xerox Corporation.

The Critical Skills Training program (CST), jointly developed by Xerox and RIT, is described as a case study by Casner-Lotto et al. (1988). The CST program was created in response to an internal mismatch of skills arising from changing technology. It is now a full-year re-education and career change program.

The joint Xerox/RIT task force assessed Xerox skill needs and prepared a curriculum including 12 courses custom-designed for the special needs of the company. Courses are held at RIT separately from the regular curriculum. Trainees receive full pay and benefits during training. Re-entry has been successful, with follow-up evaluations indicating that managers are satisfied with the new skills. This case is an example of how a business-higher education training link can prevent layoffs by enabling relatively short-term adaptation to changing technology.

Prairie State 2000. Economic development is a key issue around which public and private training interests can rally. Prairie State 2000 is a state-funded program in Illinois that financially assists employers and individuals in meeting their training needs. The program was begun in 1983 as part of an economic development plan to save jobs by making the state's industries more competitive.

Individual workers may receive vouchers to cover the cost of training or retraining up to $2,000. Employers may receive grants or loans if they demonstrate a training need that cannot be met within the limits of the company's

resources. The Prairie State 2000 Authority gives grants for up to 50 percent of the cost of instruction, which must be matched by recipient companies who contribute the remaining instructional costs and cover the salaries of trainees. Loans can finance 100 percent of costs, with 25 percent of the loan forgiven if the retrained employees remain in their jobs for 15 months or longer. The Authority works closely with recipients to ensure that retraining programs meet identified needs. Training may occur at the worksite, a local community college, area vocational center, or any other approved Illinois training location.

Companies are eligible for assistance if they are currently operating at a loss or if they are reinvesting all profits in their facilities. Individuals are eligible if they are receiving or eligible for unemployment benefits, or if they can demonstrate that they are soon to be laid off or will be laid off if they do not receive additional training. All grant recipients must be Illinois residents.

General Motors Automobile Services Education Program (ASEP). ASEP is a collaborative effort of General Motors (GM) and 40 community colleges across the country. The 2-year associate degree program trains technicians to service increasingly complex automobile systems while strengthening basic skills. The curriculum includes cooperative work experience at a sponsoring GM dealership as well as classroom instruction.

GM trains the faculty of each college and supplies the necessary state-of-the-art equipment, which the colleges could not otherwise afford to provide. Instruction is funded by state vocational education money, and GM dealers pay the students for the work experience component. The program is open to anyone who qualifies for entry to the community college. Frequently, dealers recommend that people attend the program as their skills become obsolete.

UAW/Ford National Education Development and Training Center. Established in 1982 by collective bargaining agreements, the National Education Development and Training Center provides programs to address rising skill requirements as new products and processes are introduced. Each local center contracts with the area school district for instructors to provide onsite education and training.

Training ranges from adult basic education to technical retraining. The basic skills component is viewed as critical, enabling employees requiring remedial education to take advantage of other courses and providing a foundation for lifelong learning. Each major plant has a joint committee of company and union representatives that analyzes training needs. Each plant also has a "life education advisor" who acts as a liaison between the committee and the school system and who offers educational counseling.

National Training Fund University Center (NTF/UC). The NTF/UC is a joint effort of the Center on Education and Training for Employment at the Ohio State University and the Sheet Metal Workers International Association. The NTF/UC is designed to improve productivity, employment, and training in the sheet metal and air conditioning industries. It conducts research, evaluates courses, trains instructors and administrators, and develops training materials for the industry. The sheet metal workers and union contractors have benefitted from more effective training for instructors of apprentices and journeymen. The university-based personnel have gained valuable experience in working cooperatively with organized labor and employers (Norton and Belcher 1984).

Greater Cincinnati Industrial Training Corporation (GCITC). The GCITC, a joint venture among the industrial machining and fabrication industries, the Greater Cincinnati Area PICs, vocational education planning districts, JTP Ohio, and the Department of Labor, is described by Scarborough (1984). This partnership was formed to develop video-based instructional material to be used by industry and vocational schools in training for machining and fabrication skills.

GCITC's National Pilot Program was conceived by the General Electric Aircraft Engine Business Group (GEAEBG) in response to the need to upgrade its work force in state-of-the-art technical skills and to ensure standardized adequate preparation for entry-level employees. GEAEBG initiated the idea of a training partnership in anticipation of projected increases in the industries' employment requirements and the decline in the supply of qualified entry-level workers nationally.

The GCITC is a nonprofit corporation created to administer this experimental program. It targets dislocated workers, JTPA-eligible adults, disadvantaged youth, and underemployed individuals. Funding is contributed jointly by the Department of Labor, GEAEBG, local PICs and Service Delivery Areas, and JTP Ohio. The instructional package includes materials for 12 initial courses, videotapes, student guides, and, for some courses, interactive video programs.

Business Development and Training Center. Although not a public-private partnership, the Business Development and Training Center (BDTC) is a unique nonprofit organization that provides training to meet local industry needs. Established in 1983, the Center serves the business and industry community in Chester and Montgomery Counties in Eastern Pennsylvania. BDTC is funded by the Advanced Technology Center of South Eastern Pennsylvania and Rouse and Associates. It is also part of the Benjamin Franklin Partnership.

Programs offer retraining for current employees, or those seeking employment, in areas that help businesses adapt to changing technology. These include all aspects of computer training, management development, administrative assistant and secretarial skills, and a joint MBA program with a local university. Programs are designed in conjunction with a business advisory board. There are no eligibility requirements for enrollees.

CONCLUSIONS AND RECOMMENDATIONS

From this brief review of the workplace context and of the kinds of public-private linkages that take place within it, several conclusions can be drawn. They support the paper's basic argument that such linkages can enhance economic productivity and also provide better job opportunities for traditionally disadvantaged groups.

They also suggest strongly the difficulties in framing policy in this area, in view of the uncertainties and complexities encountered in seeking to understand the educational and institutional issues in this field. Though partnerships remain an intriguing and attractive approach, their full potential has yet to be realized.

Major conclusions are as follows:

- The mismatch between projected labor supply and demand will have substantial effects on the economy in the decade ahead, when actual labor shortages are likely to be experienced. These effects will not be salutary. In particular, the oft-heard assertion that high technology and service jobs will be an economic panacea for disadvantaged members of the work force seems overly optimistic, especially in the absence of well-designed and generally available education and training that would permit low- or unskilled workers to get beyond the welter of minimally skilled jobs the economy is expected to create.

- The definitions of both "basic skills" and "job training" are likely to undergo change. The limited concept of simple reading and math capabilities, which qualified a worker 30 years ago to enter a variety of occupations, is giving way to a broader version that encompasses such "higher order" skills as inference, using evidence, information processing, and the like. Moreover, particularly in "high-tech" and many growth sectors, the notion of a static set of occupational skills may likewise be growing obsolete. The implications for training and schooling are considerable, yet it is difficult to define clear roles or policy directions.

- Interest in collaboration between public education and training institutions and the private sector is likely to increase, prompted in great part by the increasing need for workers, especially entry-level workers, that businesses will experience in the decade ahead. It must be stressed, however, that a variety of factors--demographic change, rising skill requirements, changes in the workplace--will complicate the formation of these partnerships, and make any precise assessments of what happens or what should happen difficult.

The review of joint public-private projects undertaken for this paper suggests the richness and variety of possibilities. It also underscores the fact that these efforts by no means predominate among programs to teach and train the work force. The more

traditional and uncoordinated modes of instruction still prevail, with public efforts still occurring without much connection with private activities, even though there is evidence that these traditional approaches are increasingly unable to meet the requirements of a rapidly changing economy.

What seems likely is that there will be continuing interest in public-private partnerships in the decade ahead, but little consensus about the appropriate directions they should take and the strongest forms of collaboration to try. The problem has two levels: on the level of content and substance, there is real debate about how much and what kind of education is enough; on the level of organization, there is little clarity about which institutions should handle which role in training the nation's work force.

The following recommendations, accordingly, are not focused on specifics, but rather on broad policy initiatives that will best serve the needs of providing adequate levels of education and training for the decade to come and also prompting greater interaction, coordination, and joint initiatives between private and public sector institutions.

RECOMMENDATION 1:

Strengthen and enlarge the nation's investment in public education.

Notwithstanding its failures, the nation's public education system remains the prime resource for educating the nation's youth and preparing them for productive careers and citizenship. Thus, any broad policies aimed at training must also include public education.

This broad recommendation has two parts. First, a stable and adequate funding base must be secured for education at all levels, especially at the elementary and secondary levels. In particular, it is clear that educating youngsters from disadvantaged, impoverished backgrounds is, on average, likely to be a costly proposition. These are precisely the youngsters for whom the nineties hold real economic opportunity--but only if they have adequate training and education.

Most current funding does not sufficiently emphasize education for the disadvantaged. Large urban areas, with concentrations of poor, minority youngsters, are usually hard pressed to maintain overall levels of education and too often lack the resources to invest adequately in schooling. Added investment--which must come in many cases from federal and state resources--seems an inevitable cost if the nation's public education system is truly to improve. A critical dimension of this added investment must be preparing instructional staff and educational administrators to cope effectively with the special needs of disadvantaged, at-risk students.

Second, qualitative improvements and enhancements must be sought. If it is indeed true that the kinds of education and training needed in the workplace are changing (and increasing), then schools will find it necessary to adapt, even as they seek to improve their overall performance, and hence must be provided with strong incentives to do so. Added funding for education must be tied to changes in instructional technique and technology that will produce graduates better able to assume the responsibilities of the workplace. It is reasonable, in exchange for added funding, to expect improved performance from the schools. Increased levels of funding, tied to specific performance measures, will be necessary to spur such improvements.

RECOMMENDATION 2:

Reorient federal vocational educational programs to permit greater flexibility, more service to disadvantaged populations, and more private sector participation.

The current array of secondary vocational education activities funded under the aegis of the Carl Perkins Act tend to be centered in the nation's public schools. There they have, in the view of many, failed to be a progressive force in training youth for the workplace and have suffered from the bureaucratic rigidity characteristic of many school systems. There is evidence, moreover, that traditional vocational education programs, focused on occupational skills, fail to achieve long-term impacts on participants.

Several kinds of changes might be tried. First, public schools could be considered one competing institution for vocational education funds, rather than the presumptive recipient of the lion's share, as frequently is the case. This should stimulate other training sources to devise more innovative approaches, unencumbered by curriculum and other requirements of the school system. In particular, high-leverage matching grants to private firms (where federal dollars are matched four to one) could be tried on a pilot basis for training or workplace-related education programs that are highly meritorious and, most important, show promise for being replicated elsewhere. Such initiatives would have to be selected carefully, to avoid merely substituting public money for private funds that would have been spent anyway. If successful, however, such funding could provide clear incentives to private businesses to improve their training efforts and to share knowledge more broadly with both the private and public sectors.

Finally, increases in the amount of vocational education funds earmarked for disadvantaged populations seem in order. In light of the increasing scarcity of entry-level workers and the traditional difficulties experienced in schooling and training youngsters from disadvantaged backgrounds, such redirection would represent a more informed means of distributing available public funds among groups who can most benefit from them.

RECOMMENDATION 3:

Modify performance incentives in the Job Training Partnership Act to encourage longer-term investments in education and innovative training programs.

The current performance measures, many of which are mandated in the legislation, tend to encourage immediate job placement and low-cost training programs, typically at the expense of longer-term training, basic educational programs, and initiatives that target the hardest-to-train and employ. Many JTPA programs require applicants to have minimum educational attainment before they can be enrolled, a restriction that ensures more job-ready enrollees but also tends to exclude many applicants who badly need training and other services.

JTPA programs have also tended to underserve youth. Indeed, although the legislation mandates that 40 percent of JTPA funds be directed to youth, in practice local programs in the aggregate have usually failed to reach that mark.

The overriding performance measures--calling for low cost-per-placement and high "entered employment" rates--could be successfully relaxed and supplemented with measures that encourage a different mix of training and education

schemes. For example, one scheme might permit a 10 percent or so relaxation in these two measures, provided that a fixed minimum of local funds are directed to basic education programs, or to extended (and costlier) training programs of more than 6 months, or targeted on such traditionally hard-to-serve groups as school dropouts or graduates who have been unemployed for 6 or more months.

Finally, some fraction of JTPA funds could be targeted to innovative but often riskier public-private training initiatives. These programs can now be funded under JTPA, but overall performance targets tend to limit their use and discourage experimentation in general. Pilot and demonstration efforts (such as the workplace literacy programs the Labor Department has recently begun to fund) would expand the base of knowledge, provide new models for replication throughout the employment training system, and represent important investments in our capacity to build "human capital," instead of merely promoting high placement rates at economical cost.

RECOMMENDATION 4:

Provide stronger federal support for public-private training initiatives.

A single-purpose funding stream targeting promising initiatives that integrally involve public and private training resources and institutions would signal a commitment to such efforts and would provide seed money to foster creativity and collaboration.

An independent national commission could be formed to establish the goals and objectives of such an effort and to guide the selection of programs to be funded. Drawn from the Departments of Labor, Education, and Commerce, as well as from leaders of the business community, the commission should focus on one major aim: to foster effective partnerships that train tomorrow's workers in the broad range of skills they will need to function effectively.

Pilot and demonstration programs could focus on both institutional and programmatic objectives. For example, one set of objectives would focus on specific collaborative forms with well-articulated objectives. Grants might be used to establish "skills corporations," whose aims would have to reflect local conditions and needs, or school-business efforts with clearly defined training or educational criteria.

A second set of objectives would focus on the content of training and educational programs. This stream of funding might target "high-tech" training in the schools, job-related training programs that target disadvantaged youth (or are located in inner-city schools), or entry-level training, conducted by business, that provides innovative mixes of "higher-order" and job-specific skills.

Such a program need not involve major infusions of public funds. Ideally, in fact, it would involve a substantial match of private dollars, with the intent of drawing these resources into model efforts that, again, could be shared nationally.

Many of the programs would, altogether appropriately, be experimental. This reflects the current need to expand our basic knowledge of how to strengthen public-private training efforts and make them more effective. This effort would, in the best sense, be a "research and development" initiative, with the potential for long-term benefits for a broad spectrum of the economy.

RECOMMENDATION 5:

Support development and use of training and education techniques that teach higher-order and cognitive skills or focus on innovative work force preparation techniques in high tech/growth industries.

It seems clear that many traditional modes of training present too fixed a set of skills for a workplace increasingly subject to change, indeed where changing job skills and requirements are becoming the norm. Ideal training programs will strike a balance between job-specific skills and the broader range of higher-order thinking skills--inference, deduction, judgment, and the like--that form the essential base for job-specific skills to be used effectively and to be adapted to changing workplace requirements.

Likewise, greater attention must be paid to extending these concepts to education-centered programs designed to teach basic skills. As previously noted, the employability of workers and the competitiveness of industry are affected not only by a lack of technical skills, but also by a lack of basic literacy and computational skills.

It has been convincingly argued that functional literacy is most effectively taught, particularly for adults, in reference to the practical context of actual job applications (Mikulecky 1985, Philippi 1988). The 1988 publication, *The Bottom Line: Basic Skills in the Workplace,* summarizes the argument for contextual workplace education:

> The kinds of reading, writing and analytical tasks workers perform routinely are different from those students are taught in school or in general adult literacy programs. Typically, students read to learn information that needs to be remembered for later use. Workers' literacy tasks are oriented to satisfying more immediate and specific goals: "reading to do" and "reading to assess" characterize job-related literacy practices. And, since the application of basic skills on the job is embedded in real job tasks, education and training programs are moving more towards using the functional contexts of adult workers to teach these skills as opposed to a more school-based approach. (p. 6)

Because providing a functional context for teaching literacy can be expedited through public-private partnerships, workplace literacy is becoming a key issue around which such partnerships may be formed. Any number of potential cooperative arrangements exist. Public school instructors can be brought in to teach at job sites, job materials can be adapted for instructional use, and adult basic education courses can be redesigned to use specific occupational examples for conveying basic reading, writing, and computational knowledge. The functional context approach may also be applied to impart the higher-order problem-solving and analytical reasoning skills that are rapidly becoming commonplace requirements in the workplace.

RECOMMENDATION 6:

Build public awareness regarding the nature of changes in the economy and the workplace, the need for innovative public-private solutions, and promising initiatives that can be tried.

A particular target of such efforts should be the business community, which has the most to gain from a better-trained, more highly skilled work force. Such efforts as the Youth:

2000 initiative jointly sponsored by the Departments of Labor and Health and Human Services have been helpful in informing the public at large of some of the demographic, workplace, and training issues regarding youth. But clearly, in view of the magnitude of the problem, greater awareness is called for and can be expected to produce results.

A similar effort might focus public--and especially business--attention on the demographic issues, the training and educational needs of the workplace, and the special issues involved in training disadvantaged youth and adults. The publicity campaign could also focus on model program efforts and how they can serve business and on making the private sector aware of available resources and programs in which they can get involved.

In tandem with publicity, a clearinghouse function could be maintained to document meritorious and promising efforts. Such a mechanism could serve not only to heighten interest in the issues, but also to attract tangible responses from the business community: involvement in schools, public training efforts, or other collaborations that appear effective. Only by consistently spreading the word about workable models and promoting their widespread adoption will it be possible to address the nation's training and education needs rapidly, and thus serve not just the economy but its underskilled workers.

APPENDIX

Labor Market Information

A critical element of public-private partnerships is the exchange of relevant labor market and training information. Schools and public training institutions must be well informed on the current job market. To establish effective institutional linkages, all public and private institutions involved in the delivery of training need accurate data on changing labor market demands and occupational trends in a form that can be translated into training methods and programs. In addition, private firms that provide their own training, or contract with other providers, need to keep up to date on current training techniques.

Formal occupational information systems at the national and state levels are the National Occupational Information Coordinating Committee (NOICC) and State Occupational Information Coordinating Committees (SOICCs). These services inform trainers on projected occupational trends and allow planners to anticipate changes in demand for specific skill preparation. The National Crosswalk Service Center, funded by NOICC, operates a computerized database that cross-references six federal occupational classification systems: Dictionary of Occupational Titles; Standard Occupational Classification; Occupational Employment Statistics; Classification of Instructional Programs; Guide for Occupational Exploration; and the 1980 Census Occupations. Crosswalk is used by planners from government agencies, research institutes, private corporations, vocational rehabilitation organizations, career information services, and SOICCs.

However, Bureau of Labor Statistics projections and NOICC and SOICC data are aggregated at the national and state level. They are useful for large-scale planning but do not accurately interpret occupational changes at the local level where the response to those changes is implemented. Furthermore, there are limits to the accuracy of long-range forecasts even at the national level. Therefore, alternative information networks are needed that provide relevant, short-term data for regions and localities that can be readily translated for program planning. Public-private linkages provide a potential medium for establishing local or regional networks.

Barton (1983) suggests that detailed information is required, beyond what can be provided by NOICC and SOICCs, on local occupational markets and the more immediate requirements of local industry. Specifically, local trainers must know precisely what hiring patterns are prevalent, which companies do their own training, and what skills will ensure that graduates will be hired. Barton stresses that information must be available that is useful on a day-to-day operational basis. He recommends that this be accomplished through Community Occupational Information Coordinating Committees, a local counterpart to the national and state versions, and through account managers from public training institutions who maintain consistent close contact with

local employers to determine how graduates are faring, how hiring policies are changing, what employers want changed, and what new production processes require.

Information exchange is a necessary but not sufficient condition for establishing collaborative relationships between public education and training and private employers. Given reliable labor market data, the question still remains whether training institutions can respond quickly and effectively. Training facilities often lack state-of-the-art equipment, faculty knowledge, and financial resources that would enable flexible response to short-term training demands. Beyond opening up communication and feedback, public-private partnerships must work to apply that information effectively to practice.

REFERENCES

Items with ED numbers may be ordered from the ERIC Document Reproduction Service, 3900 Wheeler Avenue, Alexandria, VA 22304-6409, (800) 227-3742, (703) 823-0500.

Adler, Paul. "New Technologies, New Skills." *California Management Review* 29, no. 1 (Fall 1986): 9-27.

Alic, John A., and Harris, Martha C. "Employment Lessons from the Electronics Industry." *Monthly Labor Review* 109, no. 2 (February 1986): 27-36. (ERIC No. EJ 330 842).

Attewell, Paul. "The Deskilling Controversy." *Work and Occupations* 14, no. 3 (August 1987): 323-346. (ERIC No. EJ 357 624).

Barton, Paul E. "Responding to Change: Occupational Preparation in the 1980s." In *Responsiveness of Training Institutions to Changing Labor Market Demands,* edited by R. Taylor, H. Rosen, and F. Pratzner. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1983. (ERIC Document Reproduction Service No. ED 237 736).

Barton, Paul E. "What High School Students Know and Can Do." Paper presented at the Conference Board conference, Beyond Business-Education Partnerships, Washington, D.C., March 8, 1988. (ERIC Document Reproduction Service No. ED 293 996).

Becker, Gary. *Economic Theory.* New York: Alfred Knopf, 1971.

Becker, Richard J. "Education and Work: A Historical Perspective." In *Education and Work: Eighty-first Yearbook of the National Society for the Study of Education,* edited by H. F. Silberman. Chicago: University of Chicago Press, 1982.

Berryman, Sue. "The Economy, Education and At-Risk Children: What Do We Need and What Do They Need?" Paper presented at the fall meeting of the Education Writers Association: Can Schools Change to Save Kids?, Racine, Wisconsin, October 30 - November 1, 1987.

Bluestone, Barry, and Harrison, Bennett. *The Deindustrialization of America.* New York: Basic Books, 1982.

The Bottom Line: Basic Skills in the Workplace. Washington, DC: U.S. Department of Education and U.S. Department of Labor, 1988. (ERIC Document Reproduction Service No. ED 291 922).

Braverman, Harry. *Labor and Monopoly Capital.* New York: Monthly Review Press, 1974.

Building a Quality Workforce. Washington, DC: U.S. Department of Labor, U.S. Department of Education, and U.S. Department of Commerce, 1988.

"Business-Education Partnerships Ineffective in '80s, Advocate Says." *Vocational Training News* 19, no. 12 (March 24, 1988): 6.

Carnevale, Anthony. "Prepared Statement." In *Competitiveness and the Quality of the American Workforce.* Hearings before the Subcommittee on Education and Health of the Joint Economic Committee. Washington, DC: U.S. Congress, 1987. (ERIC Document Reproduction Service Nos. ED 295 013-014).

Casner-Lotto, Jill and Associates. *Successful Training Strategies: Twenty-Six Innovative Corporate Models.* San Francisco: Jossey-Bass, 1988.

Clark, Donald M. "Industry-Education Cooperation in Human Resource Development." *Journal of Studies in Technical Careers* 5, no. 1 (Winter 1983): 47-54. (ERIC No. EJ 272 152).

Clinton, Bill. "Prepared Statement." In *Competitiveness and the Quality of the American Workforce.* Hearings before the Subcommittee on Education and Health of the Joint Economic Committee. Washington, DC: U.S. Congress, 1987. (ERIC Document Reproduction Service Nos. ED 295 013-014).

Cohen, Stephen S. "Prepared Statement." In *Competitiveness and the Quality of the American Workforce.* Hearings before the Subcommittee on Education and Health of the Joint Economic Committee. Washington, DC: U.S. Congress, 1987. (ERIC Document Reproduction Service Nos. ED 295 013-014).

Crawford, Michael. "Community Colleges and the Adult Learner." In *Adults and the Changing Workplace. 1985 Yearbook of the American Vocational Association,* edited by C. H. Shulman. Arlington, VA: AVA, 1984. (ERIC Document Reproduction Service No. ED 252 663).

Cyert, Richard M., and Mowery, David C., eds. *Technology and Employment: Innovation and Growth in the U.S. Economy.* Washington, DC: Committee on Science, Engineering, and Public Policy, National Academy of Sciences-National Research Council, 1987. (ERIC Document Reproduction Service No. ED 286 063).

Diehl, W. A., and Mikulecky, L. J. "The Nature of Reading at Work." *Journal of Reading* 24, no. 3 (December 1980): 221-227. (ERIC No. EJ 236 480).

Doeringer, Peter B. "Occupational Education and Training for the 1980s." In *Jobs and Training in the 1980s,* edited by P. Doeringer and B. Vermeulen. Boston: Martinus Nijhoff, 1981.

El-Khawas, Elaine; Carter, Deborah; and Ottinger, Cecilia. ***The Community College Fact Book.*** New York: American Council on Education/Macmillan, 1988.

Ganzglass, Evelyn, and Heidkamp, Maria. ***State Strategies to Train a Competitive Workforce: The Emerging Role of State-Funded Job Training Programs.*** Washington, DC: Center for Policy Research, National Governors' Association, 1987.

Greenwood, K.; Skinkle, J.; and Larson, E. ***Strategies for Involving the Private Sector in Job Training Programs.*** College Station: The Education-for-Work Linkage Project, Texas A&M University, 1981. (ERIC Document Reproduction Service No. ED 211 855).

Hirschhorn, Larry. ***Beyond Mechanization.*** Cambridge: MIT Press, 1985.

Hodgkinson, Harold. ***Guess Who's Coming to Work?*** Occasional Paper no. 116. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1986. (ERIC Document Reproduction Service No. ED 269 646).

Irwin, Paul M. "Adult Literacy Issues Programs, and Options." ***Issue Brief.*** Washington, DC: Congressional Research Service, September 6, 1988.

Johnston, William B., and Packer, Arnold H. ***Workforce 2000: Work and Workers for the 21st Century.*** Indianapolis: Hudson Institute, 1987. (ERIC Document Reproduction Service No. ED 290 887).

Kirsch, Irwin S., and Jungeblut, Ann. ***Literacy: Profiles of America's Young Adults.*** Princeton, NJ: National Assessment of Educational Progress, Educational Testing Service, 1986. (ERIC Document Reproduction Service No. ED 275 692).

Kutscher, Ronald E., and Personick, Valerie A. "Deindustrialization and the Shift to Services." ***Monthly Labor Review*** 109, no. 6 (June 1986): 3-13. (ERIC No. EJ 335 475).

Kuttner, Bob. "The Declining Middle." ***The Atlantic Monthly,*** July 1983, pp. 60-72.

Lacey, Richard A., and Kingsley, Christopher. ***A Guide to Working Partnerships.*** Waltham, MA: Center for Human Resources, Brandeis University, 1988. (ERIC Document Reproduction Service No. ED 295 001).

Lazerson, Marvin, and Grubb, W. Norton, eds. ***American Education and Vocationalism: A Documentary History 1870-1970.*** New York: Teachers College Press, 1974.

Lee, Chris. "Basic Training in the Corporate Schoolhouse." ***Training*** 25, no. 4 (April 1988): 27-36. (ERIC No. EJ 368 394).

Lerner, Max J. *Articulation between For-Profit Private Occupational Schools and Secondary Vocational Programs/Colleges and Universities.* Information Series no. 315. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1987. (ERIC Document Reproduction Service No. ED 284 063).

Levin, Henry. *The Educationally Disadvantaged: A National Crisis. Working Paper #6. The State Youth Initiatives Project.* Philadelphia: Public/Private Ventures, July 1985. (ERIC Document Reproduction Service No. ED 264 313).

Levin, Henry, and Rumberger, Russell. "The Low-Skill Future of High Tech." *Technology Review* (August-September 1983): 18-21.

Levin, Henry, and Rumberger, Russell. "Educational Requirements for New Technology: Visions, Possibilities and Current Realities." *Educational Policy*, vol. 1. Stanford, CA: Stanford Education Policy Institute, Stanford University, 1987. (ERIC Document Reproduction Service No. ED 271 836).

Levine, Marsha, and Trachtman, Roberta, eds. *American Business and the Public School: Case Studies of Corporate Involvement in Education.* New York: Teachers College Press, 1988.

McMullan, Bernard J., and Snyder, Phyllis. *Allies in Education. Schools and Businesses Working Together for At-Risk Youth. Volume I: Findings from the National Assessment.* Philadelphia: Public/Private Ventures, Fall 1987. (ERIC Document Reproduction Service No. ED 291 822).

MDC, Inc. *America's Shame, America's Hope: Twelve Million Youth at Risk.* Chapel Hill, NC: MDC, Inc., 1988.

Melloan, George. "Public Education's Failures Plague Employment." *Wall Street Journal,* June 21, 1988, p. 39.

Meyerson, Martin, and Zemsky, Robert. *Training's Policies: Public and Private Reinforcement for the American Economy. Final Report. The Impact of Public Policy on Education and Training in the Private Sector.* Philadelphia: University of Pennsylvania, 1985. (ERIC Document Reproduction Service No. ED 265 377).

Mikulecky, Larry, "Literacy Task Analysis: Defining and Measuring Occupational Literacy Demands." Paper presented at the annual meeting of the American Educational Research Association, Chicago, Illinois, 1985. (ERIC Document Reproduction Service No. ED 262 206).

Moss, Jerome, Jr. "Is Vocational Education Ready for Collaboration?" In *Collaboration: Vocational Education and the Private Sector. 1984 Yearbook of the American Vocational Association.* Arlington, VA: AVA, 1983. (ERIC Document Reproduction Service No. ED 254 625).

National Commission on Excellence in Education. *A Nation at Risk.* Washington, DC: U.S. Government Printing Office, 1983. (ERIC Document Reproduction Service No. ED 226 006).

National Institute for Work and Learning. *Industry/Education/Labor Collaboration: A Directory of Local Collaborative Councils.* Washington, DC: NIWL, 1981.

Norton, Robert E., and Belcher, James O. *A Guide to Linkages between Vocational Education and Organized Labor in the United States.* Research and Development Series no. 252. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1984. (ERIC Document Reproduction Service No. ED 255 765).

Parnes, Herbert. *Developing Human Capital.* Information Series no. 306. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1985. (ERIC Document Reproduction Service No. ED 268 375).

Philippi, Jorie. "Matching Literacy to Job Training: Some Applications from Military Programs." *Journal of Reading* 31, no. 7 (April 1988): 658-666. (ERIC No. EJ 368 684).

Piore, M. J. "Notes for a Theory of Labor Market Stratification." In *Labor Market Segmentation,* edited by R. C. Edwards, M. Reich, and D. M. Gordon. Lexington, MA: Heath, 1975.

Resnick, Lauren. "Prepared Statement." In *Competitiveness and the Quality of the American Workforce.* Hearings before the Subcommittee on Education and Health of the Joint Economic Committee. Washington, DC: U.S. Congress, 1987. (ERIC Document Reproduction Service Nos. ED 295 013-014).

Scarborough, Robert E. "Collaborative Efforts with Industry, Government and Education." In *Adults and the Changing Workplace. 1985 Yearbook of the American Vocational Association,* edited by C. H. Shulman. Arlington, VA: AVA, 1984. (ERIC Document Reproduction Service No. ED 252 663).

Silberman, Harry F. "Problems of Cooperation and Coordination in Vocational Education. In *Education and Work: Eighty-first Yearbook of the National Society for the Study of Education,* edited by H. F. Silberman. Chicago: University of Chicago Press, 1982.

Trist, E. L. "The Evolution of Socio-Technical Systems." In *Perspectives on Organizational Design and Performance,* edited by Andrew Van de Ven and William Joyce. New York: Wiley, 1981.

U.S. Bureau of Labor Statistics. *Projections 2000.* Bulletin 2302. Washington, DC: Bureau of Labor Statistics, U.S. Department of Labor, 1988.

Weisbord, Marvin. ***Productive Workplaces.*** San Francisco: Jossey-Bass, 1987.

Work America Institute. ***Work in America Bulletin,*** December 1987.

Work America Institute. ***World of Work Report,*** February 1985.

SELECTED BIBLIOGRAPHY

Alabama State Department of Education. ***Handbook for Business/Industry/ Education Partnerships.*** Montgomery: Alabama State Department of Education, 1983.

Bezold, Clement; Carlson, Rick J.; and Peck, Jonathan C. ***The Future of Work and Health.*** Dover, MA: Auburn House Publishing Company, 1986.

Britt, Linda, ed. ***School and Business Partnerships.*** Exemplary Practice Series. Bloomington, IN: Phi Delta Kappa, 1986. (ERIC Document Reproduction Service No. ED 270 898).

Carnoy, Martin, and Levin, Henry M. ***Schooling and Work in the Democratic State.*** Stanford: Stanford University Press, 1985.

Committee for Economic Development. ***Children in Need: Investment Strategies for the Educationally Disadvantaged.*** New York: CED, 1987.

Deegan, William L., and Drisko, Ronald. "Contract Training: Progress and Policy Issues." ***Community and Junior College Journal*** 55, no. 6 (March 1985): 14-17. (ERIC No. EJ 317 274).

Doeringer, Peter B., ed. ***Workplace Perspectives of Education and Training.*** Boston: Martinus Nijhoff, 1980.

Eurich, Nell. ***Corporate Classrooms: The Learning Business.*** Princeton, NJ: Carnegie Foundation for the Advancement of Education, 1985. (ERIC Document Reproduction Service No. ED 264 785).

National Alliance of Business. ***The Fourth "R": Workforce Readiness. A Guide for Business-Education Partnerships.*** Washington, DC: NAB, 1987. (ERIC Document Reproduction Service No. ED 289 045).

National Governors' Association. ***Bringing down the Barriers: Making America Work. Productive People, Productive Policies.*** Washington, DC: NGA, 1987. (ERIC Document Reproduction Service No. ED 284 843).

National Governors' Association. ***Results Is Education: 1988.*** Washington, DC: NGA, 1988.

National Institute of Education. ***The Vocational Education Study: The Final Report.*** Washington, DC: National Institute of Education, U.S. Department of Education, 1981. (ERIC Document Reproduction Service No. ED 205 831).

"Needed: Human Capital." Special Report. ***Business Week,*** September 9, 1988, pp. 100-141.

Parsons, Michael H. ***New Technology and the Human Response: The Issues Facing Vocational Education in the 1980s.*** 1984. (ERIC Document Reproduction Service No. ED 239 671).

Shelton, Cynthia. ***The Doable Dozen: A Checklist of Practical Ideas for School-Business Partnerships.*** Alexandria, VA: National Community Education Association, 1987.

Useem, Elizabeth L. ***Low Tech Education in a High Tech World: Corporations and Classrooms in the New Information Society.*** New York: Free Press, 1986.

Waddock, Sandra A. ***Some Criteria for the Successful Development of Public/Private Partnerships.*** Working Paper 86-21. Boston, MA: College of Business Administration, Northeastern University, April 1986.

William T. Grant Foundation. ***The Forgotten Half: Non-College Youth in America.*** Washington, DC: Commission on Work, Family, and Citizenship, William T. Grant Foundation, 1988. (ERIC Document Reproduction Service No. ED 290 822).

THE NEW 1988 ERIC INFORMATION ANALYSIS PAPERS

IN 330 $4.75

Trends and Issues in Adult Education 1988, by Susan Imel.

Reviews two groups of trends and issues in adult education. Those related to the profession deal with professionalization, certification, ethics, history, and adult learning. Those related to programming deal with access and equity and adult literacy education.

IN 331 $6.00

Training and Educating the Work Force in the Nineties: The Rationale for Public-Private Collaboration, by Thomas J. Smith and Carolyn Trist.

Considers the changing context of skills training, which is making partnerships between the public and private sectors a necessity. The background of job training legislation and institutions is described, and forms of public-private collaboration are explored. Presents six recommendations for policy initiatives that will encourage cooperative actions.

IN 332 $4.75

Trends and Issues in Career Education 1988, by Ida M. Halasz.

Examines trends and issues related to helping individuals with career concerns in five areas: career education as a viable construct, impact of the changing workplace, programs for adults, programs for youth with special needs, and the use of computers in career education.

IN 333 $6.00

Career Development Programs in the Workplace, by Lynn Slavenski and Marilyn Buckner.

The social and economic changes affecting career development programs are described. The theoretical bases and components of career development programs are reviewed. A model that includes the phases of staffing, evaluating, and developing is presented in terms of the systematic use of programs and tools that support the management cycle in organizations.

IN 334 $4.75

Trends and Issues in Vocational Education 1988, by Wesley E. Budke.

Traces the influence of social, economic, and technological changes on the vocational education and training enterprise. Delineates three major trends in vocational education--the reform movement, changing administrative and instructional roles, and access--and describes specific issues confronting vocational educators.

IN 335 $6.00

Retaining At-Risk Students: The Role of Career and Vocational Education, by Lloyd W. Tindall.

Reviews the causes of at-risk status and their implications for the U.S. labor force. Describes vocational and nonvocational strategies and exemplary programs for serving at-risk youth. Discusses the role of career and vocational educators in addressing the problems of these youth.